

# HYDROGEOLOGIC WELL COMPLETION REPORT GUNNISON COPPER PROJECT COCHISE COUNTY, ARIZONA

by Haley & Aldrich, Inc. Phoenix, Arizona

for Excelsior Mining Corp. Phoenix, Arizona



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			S TIFICKTE	
List	of Tabl	es	49659	V
List	of Figu	res	CANDREVA S	V
1.	Intro	ductio	n ARIZONA, U.S.P.	1
	1.1	DACKC	COULING	1
	1.1	1.1.1	Site Description	1
		1.1.1	Geologic Setting	1
	1.2		HYDROGEOLOGY	2
	1.2		Basin-Fill Alluvium	2
			Paleozoic Rocks within the Mineralized Zone Hydrogeology	3
			Unaltered Paleozoic Sedimentary Rocks Outside the Mineralized Zone	3
			Texas Canyon Intrusives	3
	1.3		NG AND WELL INSTALLATION PROGRAM	3
	1.5		Two-Inch Piezometers	4
			Four-Inch and Six-Inch Cased Wells	4
			Open Borehole Completion Wells	5
	1.4		LOGIC DESCRIPTIONS AND GEOPHYSICAL LOGGING	5
				6
	1.5		DEVELOPMENT PROGRAM	6
	1.6		ER TEST PROGRAM	6
	1.7 1.8		NDWATER QUALITY TESTING HOLE DEVELOPMENT PROGRAM	6
2.	Drill	ing and	d Well Installation Summary	7
	2.1	WELL	NSH-007	7
		2.1.1	Drilling and Casing Installation	7
		2.1.2	Geophysical Logging	7
		2.1.3	Lithology	8
		2.1.4	Borehole Cleanout and Liner Installation	8
		2.1.5	Well Development	9
	2.2	WELL	NSH-008	9
		2.2.1	Drilling and Well Installation	9
		2.2.2	Geophysical Logging	10
		2.2.3	Lithology	10
		2.2.4	Well Development	11
	2.3	WELL	NSH-009	12
		2.3.1	Drilling and Well Installation	12
		2.3.2	Geophysical Logging	12
		2.3.3	• • • • • • • • • • • • • • • • • • • •	13
		2.3.4	<del></del> ,	13
	2.4		NSH-010	14
		2.4.1	Drilling and Casing Installation	14
		2.4.2	-	14



		Page
	2.4.3 Lithology	15
	2.4.4 Borehole Clean Out and Liner Installation	15
	2.4.5 Well Development	15
2.5	WELL NSH-011	16
2.6	WELL NSH-012	16
	2.6.1 Borehole Drilling and Well Installation	17
	2.6.2 Geophysical Logging	17
	2.6.3 Lithology	17
	2.6.4 Well Development	17
2.7	WELL NSH-013	18
	2.7.1 Drilling and Casing Installation	18
	2.7.2 Geophysical Logging	18
	2.7.3 Lithology	19
	2.7.4 Well Development	19
2.8	WELL NSH-014	20
	2.8.1 Borehole Drilling and Abandonment	20
	2.8.2 Lithology	20
2.9	WELL NSH-014B	20
	2.9.1 Drilling and Well Installation	21
	2.9.2 Geophysical Logging	21
	2.9.3 Lithology	21
	2.9.4 Well Development	22
2.10	WELL NSH-015	22
	2.10.1 Drilling and Casing Installation	22
	2.10.2 Geophysical Logging	23
	2.10.3 Lithology	23
	2.10.4 Well Development	24
2.11	WELL NSH-016	24
	2.11.1 Drilling and Casing Installation	24
	2.11.2 Geophysical Logging	24
	2.11.3 Lithology	25
	2.11.4 Borehole Cleanout and Liner Installation	25
	2.11.5 Well Development	26
2.12	WELL NSH-017	26
	2.12.1 Borehole Drilling and Well Installation	26
	2.12.2 Geophysical Logging	26
	2.12.3 Lithology	27
	2.12.4 Well Development	27
2.13	WELL NSH-018	28
	2.13.1 Borehole Drilling and Well Installation	28
	2.13.2 Geophysical Logging	28
	2.13.3 Lithology	29
	2.13.4 Well Development	29
2.14	WELL NSH-019	30
	2.14.1 Drilling and Casing Installation	30



		Page
	2.14.2 Geophysical Logging	30
	2.14.3 Lithology	31
	2.14.4 Well Development	31
2.15	WELL NSH-020	32
	2.15.1 Drilling and Well Installation	32
	2.15.2 Geophysical Logging	32
	2.15.3 Lithology	33
	2.15.4 Well Development	33
2.16	WELLS NSH-021 & NSH-021B	34
2.17	WELL NSH-021C	34
	2.17.1 Drilling and Casing Installation	34
	2.17.2 Geophysical Logging	34
	2.17.3 Lithology	35
	2.17.4 Well Development	36
2.18	WELL NSH-022	36
	2.18.1 Drilling and Well Installation	36
	2.18.2 Geophysical Logging	36
	2.18.3 Lithology	37
	2.18.4 Well Development	37
2.19	WELL NSH-023	38
	2.19.1 Drilling and Casing Installation	38
	2.19.2 Geophysical Logging	38
	2.19.3 Lithology	39
	2.19.4 Well Development	39
2.20	WELL NSH-024	40
	2.20.1 Drilling and Casing Installation	40
	2.20.2 Geophysical Logging	40
	2.20.3 Lithology	41
	2.20.4 Well Development	41
2.21	WELL NSH-025	42
	2.21.1 Drilling and Well Installation	42
	2.21.2 Geophysical Logging	42
	2.21.3 Lithology	42
	2.21.4 Well Development	43
2.22	WELL NSH-026	43
	2.22.1 Drilling and Casing Installation	43
	2.22.2 Geophysical Logging	44
	2.22.3 Lithology	44
	2.22.4 Well Development	45
2.23	WELL NSH-027	45
	2.23.1 Drilling and Well Installation	45
	2.23.2 Geophysical Logging	45
	2.23.3 Lithology	46
	2.23.4 Well Development	46
2.24	WELL NSH-028	46



				Page
		2.24.1	Drilling and Casing Installation	46
		2.24.2	Geophysical Logging	47
		2.24.3	Lithology	48
		2.24.4	Well Development	48
	2.25	WELL N	NSH-029	48
		2.25.1	Drilling and Well Installation	49
		2.25.2	Lithology	49
		2.25.3	Well Development	49
	2.26	WELL N	NSH-030	49
		2.26.1	Drilling and Well Installation	50
			Lithology	50
		2.26.3	Well Development	50
	2.27	WELL N	NSH-031	50
		2.27.1	Drilling and Well Installation	51
			Lithology	51
		2.27.3	Well Development	51
	2.28	WELL N	NSH-032	51
		2.28.1	Drilling and Well Installation	52
		2.28.2	Lithology	52
		2.28.3	Well Development	52
3.	Core	hole De	evelopment Summary	53
4.	REFE	RENCE	S	54

TABLES
FIGURES
APPENDIX A – Lithology Logs
APPENDIX B – Well Construction Field Forms
APPENDIX C – Well Development Field Forms
APPENDIX D – Geophysical Logs (on disc)

**APPENDIX E – Corehole Cleanout Records** 



# List of Tables

Table No.	Title
1	Well Construction Summary
II	Geophysical Logging Summary
III	Corehole Cleanout Summary

# List of Figures

Figure No.	Title
1	Site Location Map
2	Well Location Map
3	NSH-007 As-Built Diagram
4	NSH-008 As-Built Diagram
5	NSH-009 As-Built Diagram
6	NSH-010 As-Built Diagram
7	NSH-012 As-Built Diagram
8	NSH-013 As-Built Diagram
9	NSH-014B As-Built Diagram
10	NSH-015 As-Built Diagram
11	NSH-016 As-Built Diagram
12	NSH-017 As-Built Diagram
13	NSH-018 As-Built Diagram
14	NSH-019 As-Built Diagram
15	NSH-020 As-Built Diagram
16	NSH-021C As-Built Diagram
17	NSH-022 As-Built Diagram
18	NSH-023 As-Built Diagram
19	NSH-024 As-Built Diagram
20	NSH-025 As-Built Diagram
21	NSH-026 As-Built Diagram
22	NSH-027 As-Built Diagram
23	NSH-028 As-Built Diagram
24	NSH-029 As-Built Diagram
25	NSH-030 As-Built Diagram
26	NSH-031 As-Built Diagram
27	NSH-032 As-Built Diagram



# 1. Introduction

Excelsior Mining Corporation (Excelsior) contracted Haley & Aldrich, Inc. (Haley & Aldrich) to provide field oversight of the drilling, construction, and testing of a series of hydrologic test holes for the Gunnison Copper Project site located in Cochise County, Arizona (Site; Figure 1). Haley & Aldrich prepared a Hydrogeologic Conceptual Model (Haley & Aldrich, 2012) and provided assistance to address the technical requirements of the Aquifer Protection Permit (APP) and Underground Injection Control (UIC) programs. Haley & Aldrich also recommended a well installation and testing program to support the hydrologic study required for the APP and UIC programs. Excelsior prepared the final well installation and testing program, prepared technical specifications, and selected contractors.

Haley & Aldrich provided field oversight and interpretation of data collected during the well installation and testing program. This report summarizes data collected by Haley & Aldrich during the borehole drilling, borehole analysis, well installation, and development activities. Results from the aquifer testing program and groundwater quality sampling results will be summarized in separate reports.

## 1.1 BACKGROUND

# 1.1.1 Site Description

The Site is located approximately 65 miles east of Tucson, Arizona on the southeastern flank of the Little Dragoon Mountains in the Johnson Camp Mining District (Figure 1). The Gunnison Copper Project contains copper oxide and sulfide mineralization in two deposits which are referred to as the North Star and South Star deposits. The wells completed in the drilling program summarized in this report were completed within the footprint of the North Star Deposit.

# 1.1.2 Geologic Setting

The Site is located within the Basin and Range physiographic province of southeast Arizona. Tertiaryaged, large-scale normal faulting has resulted in a series of upthrown mountain ranges and intervening basins filled with Tertiary- to Quaternary-aged unconsolidated to partially-consolidated alluvial sand, silt, clay, and cobbles.

The North Star Deposit is located along the southeastern slope of the Little Dragoon Mountains within a north-south trending basin bounded to the east by the Gunnison Hills (Figure 1). The Little Dragoon Mountains are an isolated, fault-bounded, upthrown block consisting of early-Tertiary Texas Canyon quartz monzonite stock which displaced and tilted the existing Paleozoic sedimentary rocks. The mineralized Paleozoic host rocks strike approximately north-northwest and generally dip between 20 and 45 degrees towards the east. As the basin developed, alluvial materials were deposited east of the Little Dragoon Mountains and basin fill thicknesses increased from the Little Dragoon Mountain front to approximately 1,800 feet thick immediately west of the Gunnison Hills (Harshbarger, 1973). In the vicinity of the North Star Deposit, basin fill thickness ranges from 200 to 300 feet along a minor bedrock high located just east-southeast of the deposit, to approximately 700 feet thick (or more) along the northeastern margin of the deposit (Groundwater Resources Consultants [GWRC], 1997).

The primary geologic features of the North Star deposit are:

- 1. Basin-fill alluvium (Tertiary to Quaternary).
- 2. Texas Canyon guartz monzonite stock (early Tertiary).



- 3. Sequence of east-northeast Paleozoic dipping rocks (in descending order):
  - Black Prince Limestone (Pennsylvanian/Mississippian);
  - Escabrosa Limestone (Mississippian);
  - Martin Formation (Devonian);
  - Upper, Middle, and Lower Abrigo Formation (Cambrian); and
  - Bolsa Quartzite (Cambrian).
- 4. Pinal Schist (Pre-Cambrian, Weitz, 1976).
- 5. A system of high-angle normal and reverse faults with dips ranging from 60 to 80 degrees.
- 6. Bedding parallel faults and fracture zones, primarily in the Martin and Upper and Middle Abrigo units (Independent Mining Consultants, 2011).

During intrusion of the Texas Canyon quartz monzonite, the Paleozoic sedimentary rocks were altered by contact metamorphism, physical displacement, and by hydrothermal fluids that migrated through pre-existing and contemporaneous fractures in the host rocks. These fluids precipitated copper sulfides primarily along existing fracture surfaces in a skarn-type deposit; some of the mineralized zone was subsequently oxidized via meteoric water processes. Copper sulfide mineralization has formed preferentially in the proximal (higher metamorphic grade) skarn facies, particularly along stratigraphic units such as the Abrigo and Martin formations, and within structurally complex zones. The intrusion also formed wide zones of calc-silicate and hornfels alteration within the Paleozoic rocks (Independent Mining Consultants, 2011).

# 1.2 AREA HYDROGEOLOGY

Hydrogeologic units are generally based on rock types, aquifer properties, and water quality. They are grouped together based on similar water storage and transmission capabilities, as well as similar water quality. Hydrogeologic units identified within the study area include:

- Basin-fill alluvium;
- Paleozoic rocks within the mineralized zone;
- Paleozoic rocks outside of the mineralized zone; and
- Texas Canyon quartz monzonite.

A generalized understanding of the hydrogeologic units underlying the Site prior to this drilling program is summarized below.

## 1.2.1 Basin-Fill Alluvium

Before the drilling program, there was limited existing data regarding the occurrence of groundwater in the basin fill alluvium overlying the North Star Deposit. There were two holes drilled in 2011-2012 that were completed in the basin-fill alluvium: NSD-020 and NSH-006. The borehole for NSD-020 was drilled to a total depth of 660 feet with a saturated basin fill alluvium thickness of approximately 30 feet. The borehole for well NSH-006 was drilled to approximately 684 feet and had approximately 40 feet of saturated alluvium.



Four alluvial wells were planned as part of the hydrologic investigation, one was installed and was dry; the other three were cancelled due to lack of saturated alluvium observed during the drilling of nearby boreholes completed to deeper intervals. In addition, an alluvial basin piezometer NSH-011 was installed by Excelsior during the investigation to the east of the North Star Deposit area. Because saturated alluvium was not identified at the planned locations of alluvial wells, the existing alluvial wells NSH-006 and NSH-011 were tested as part of the aquifer testing program; the results of those tests are summarized in the aquifer testing report.

# 1.2.2 Paleozoic Rocks within the Mineralized Zone Hydrogeology

Hydrologic test wells installed during this investigation were primarily installed in the altered Paleozoic bedrock; prior to the investigation there were five existing hydrologic test wells and a series of open coreholes where water level data has been collected by Excelsior since 2012. The new wells will add to the understanding of the fractured bedrock hydrology and how the units and geologic features control the flow of groundwater.

## 1.2.3 Unaltered Paleozoic Sedimentary Rocks Outside the Mineralized Zone

Two wells were planned in the unaltered Paleozoic rocks to the east of the North Star Deposit: NSH-018 and NSH-020. Prior to the investigation, no wells existed in the vicinity.

## 1.2.4 Texas Canyon Intrusives

No hydrologic holes existed in the Texas Canyon quartz monzonite prior to this investigation. Two wells (NSH-015 and NSH-016) were installed in the Texas Canyon quartz monzonite during this investigation.

## 1.3 DRILLING AND WELL INSTALLATION PROGRAM

The drilling and well installation program commenced on 16 October 2014 and included a total of 26 wells (5 piezometers and 21 hydrogeologic test wells). The planned well locations are identified using a two-letter symbol with an NSH prefix; the identifiers are assigned by Excelsior when well locations are planned in alphabetical order. Once a borehole has commenced at the planned location, a three-digit numerical identification is assigned with an NSH prefix. These numbers are assigned sequentially as the wells are started. During this investigation, wells NSH-007 through NSH-032 were installed.

The program was completed on 10 February 2015 and was immediately followed by development and testing activities. All work was completed with oversight from Haley & Aldrich staff, with the exception of NSH-011 which was completed with oversight from Excelsior staff. Drilling contractors included National Exploration Wells and Pump (NEWP) for drilling and installation of the hydrogeologic test wells, and BJ Drilling Company, Inc. (BJ Drilling) for drilling and installation of the piezometers. The drilling and well installation program was conducted on a 24-hour schedule using a total of three rigs. NEWP mobilized a GEFCO Speedstar 50K (50K) drilling rig and a Schramm T685WS (685) drilling rig to the Site to support the hydrologic well drilling activities. BJ Drilling mobilized an Ingersoll Rand T3W (T3) drilling rig to complete the piezometers.

Boreholes were generally drilled by the air-rotary hammer method using foam products to stabilize the borehole and assist in the removal of cuttings. Borehole instability was noted at five of the well locations; at two of those locations (NSH-014B and NSH-022), borehole instability prevented



advancement of the borehole by the air-rotary hammer method. In order to complete the holes to the targeted zones, the mud-rotary drilling method was utilized using a tri-cone bit. At seven locations (NSH-019, NSH-21C, NSH-017, NSH-018, NSH-020, NSH-022, and NSH-027), water production from the borehole during drilling exceeded the capacity of the air-rotary hammer equipment to function as designed. In these cases, it was necessary to use a tri-cone bit in an air rotary configuration to advance the boreholes to the target depth.

Following completion of the boreholes to the target depth, geophysical surveys were conducted by International Directional Services' Colog Group (IDS-COLOG) at all locations except the piezometers. The logging surveys included geophysical logs and hydrologic testing which are further described in Section 1.4.

The hydrologic test well installation program included four primary well designs to investigate well construction methods in support of a future feasibility study. The well designs included 1) 4-inch cased wells, 2) 6-inch cased wells, 3) 8-inch open borehole interval wells, and 4) piezometers. All of the wells included a surface casing installed to a minimum of 20 feet below land surface (bls), and a surface vault completed with a concrete pad and a locking cover. Construction methods specific to each design are summarized in the following sections, and specific construction details for each well are summarized in Section 2 and Table I.

#### 1.3.1 Two-Inch Piezometers

The 2-inch piezometers were installed in 6.5-inch diameter boreholes that were drilled from the bottom of the surface casing to the design depth. Piezometer casing consisted of 2%-inch outside diameter (0.154-inch wall thickness) low-carbon steel (LCS) blank casing and screen. The screen consisted of 0.125-inch wide vertical torch-cut slots with a steel bottom cap.

The contractor installed annular materials by the tremie and pump method including filter pack, bentonite chips, and high-solids bentonite grout or gravel. The filter pack was comprised of ¼-inch to No. 8 US Mesh Tacna gravel. The filter pack was installed from the total depth of the borehole to approximately 10 feet above the top of the screen, with a 10-foot thick interval of ¾-inch bentonite chips installed over the filter pack.

For the shallow piezometers (NSH-029 and NSH-030) where the water level was within the screened interval, formation stabilizer comprised of %-inch pea gravel or Tacna filter pack that was installed from the top of the bentonite chips to land surface. For the deeper piezometers (NSH-031 and NSH-032), high-solids bentonite grout was installed by the submerged tremie method using a pump from the top of the transition sand to land surface.

#### 1.3.2 Four-Inch and Six-Inch Cased Wells

The cased well boreholes were drilled to a 10-inch diameter for the 4-inch wells and a 12-inch diameter for the 6-inch wells. These boreholes were drilled from the bottom of the surface casing to the design depth of the well. Borehole geophysical logging was conducted after the borehole was drilled prior to well installation.

The 4-inch nominal diameter well design included 4.5-inch outside diameter (0.237-inch wall thickness) LCS blank casing and screen; the screen included 0.125-inch wide vertical mill slots and a steel bottom



cap. The 6-inch nominal diameter well design includes 6.625-inch outside diameter (0.25-inch wall thickness) LCS blank casing and screen; the screen consisted of 0.125-inch wide vertical mill slots and a steel bottom cap.

The contractor installed annular materials by the tremie and pump method including filter pack, transition sand, and high-solids bentonite grout. The filter pack was comprised of ¼-inch to No. 8 US Mesh Tacna gravel. The filter pack was installed from the total depth of the borehole to approximately 10 feet above the top of the screen. A fine transition sand interval comprised of No. 20 to 40 US Mesh sand was installed over the filter pack to prevent the high-solids bentonite grout from flowing downward into the filter pack and well.

High-solids bentonite grout was installed by the submerged tremie method using a pump from the top of the transition sand to land surface. If necessary, bentonite chips or formation stabilizer was used to fill the annulus to land surface.

# 1.3.3 Open Borehole Completion Wells

The open borehole completion wells were generally installed to test the upper bedrock units or bulk bedrock properties, and were completed without materials to stabilize the intervals of the boreholes that were left open to bedrock. Drilling contractor activities associated with completion of the open borehole wells included installation of surface casing and seal; drilling and installation of intermediate casing and annular materials; drilling to the design depth; geophysical logging; and well-head completion.

A 20-inch diameter borehole was drilled to 20 feet. Surface casing consisting of 14-inch outside diameter (%-inch wall thickness) LCS blank casing was installed to 20 feet, and grouted to surface using neat cement grout. A 13-inch borehole was drilled from the bottom of the surface casing to the design depth. A layer of bentonite chips (approximately 5 feet thick) was installed in the bottom of the 13-inch borehole, and 8-inch nominal diameter steel intermediate casing was installed with the 50-foot neat cement plug at the base and a high-solids bentonite grout seal to surface.

A 7%-inch diameter borehole was drilled from the bottom of the intermediate casing to the target depth. Geophysical logging was conducted in the open interval of the borehole during a subsequent geophysical contractor mobilization; geophysical logging was not completed in the intermediate casing interval.

At three locations (NSH-007, NSH-010, and NSH-016), the borehole collapsed after completing the 7%-inch diameter open borehole to the total depth. At these locations, the boreholes were cleaned out and polyvinyl chloride (PVC) liners were installed; details for the borehole cleanouts and liners are included in the corresponding well section below.

#### 1.4 LITHOLOGIC DESCRIPTIONS AND GEOPHYSICAL LOGGING

The lithology and structure of the formation penetrated by drilling activities were evaluated from descriptions of the drilled cuttings and geophysical surveys. Lithology for each well is described in more detail in Section 2 and lithology logs for each well are included in Appendix A. Table II provides a matrix of the geophysical logs completed at each well and results of the geophysical logging are discussed further in Section 2. Geophysical logs were used to confirm lithologic contacts and finalize well designs.



They will also be utilized by Excelsior to update the geologic model. Flow logging was conducted to identify flow zones that can be used to support the hydrologic investigation. Interpretation of the flow logging will be discussed in the aquifer testing report.

# 1.5 WELL DEVELOPMENT PROGRAM

The development of each well was based on site-specific conditions, but generally involved mechanical methods including airlift, swabbing, bailing, and pumping activities. Chemical dispersant was added as necessary to assist in the development of wells which were drilled using the mud rotary method; details regarding the dispersants used at each well are included in the corresponding well development sections. Initially, an attempt was made to develop the boreholes using air pressure and the drill string prior to logging so that flow logging could be conducted in a single mobilization, but borehole instability issues at NSH-007 and NSH-010 precluded full development prior to geophysical logging. More details on the instability issues, depths, borehole cleanout, and installation of liners are included in the corresponding sections for each well.

Based on these observations, the decision was made to develop the 8-inch (open borehole completion) wells after geophysical logging was completed, and to develop the 4-inch and 6-inch wells after the casing and screen was installed. After conducting several flow logging surveys on undeveloped boreholes, the decision was made to cancel flow logging surveys on cased holes. Flow logging surveys of open borehole interval wells was not conducted until after development was completed in order to collect the most accurate and representative data possible; data that would not be impacted by any skin that may have formed on the borehole walls during drilling activities.

# 1.6 AQUIFER TEST PROGRAM

Aquifer tests were conducted at all of the wells installed, with the exception of NSH-012 which was dry, and NSH-029 through NSH-032 which were piezometers installed as observation points for other testing locations. The results of the aquifer testing will be summarized in a separate report.

## 1.7 GROUNDWATER QUALITY TESTING

Groundwater quality sampling was conducted at each of the hydrologic test wells, with the exception of NSH-012 because it was dry and piezometers NSH-029 through NSH-032. The groundwater quality will be summarized in a separate report.

# 1.8 COREHOLE DEVELOPMENT PROGRAM

Existing coreholes at the site were developed in order to expand the monitoring network for aquifer testing activities. Initially, 15 coreholes were proposed to be developed, but during the course of the investigation the decision was made to expand the network even further. Details on the corehole development program are included in Section 3.



# 2. Drilling and Well Installation Summary

## 2.1 WELL NSH-007

Well NSH-007 was sited at location NSH-CP to characterize the Sechura fault, a significant east-west trending structural feature near the north end of the North Star Deposit. Well NSH-007 was planned for completion in the upper bedrock with the intention of penetrating the Sechura fault to conduct testing to evaluate potential flow across the Atacama and Patagonia faults.

The well design was an open borehole interval design with a planned depth of 625 feet. NSH-007 was drilled by NEWP using the 50k rig utilizing the air rotary method. Upon completion, a PVC liner was installed to stabilize the open interval; details are included in Section 2.1.4.

# 2.1.1 Drilling and Casing Installation

Drilling activities for well NSH-007 commenced on 16 October 2014. An 18-inch diameter borehole was drilled to 20 feet and LCS surface casing with a 14-inch nominal diameter was installed to 20 feet, and was grouted to land surface using neat cement grout.

The borehole drilling was continued on 17 October 2014 using a 12-inch diameter air-rotary hammer bit to a depth of approximately 484 feet on 18 October 2014. Prior to installation of the intermediate casing, the lower portion of the borehole was filled with filter pack from approximately 469 to 484 feet in order to include the upper portion of the Upper Abrigo in the open borehole completion. Bentonite chips were installed in the borehole from approximately 463 to 469 feet and installation of nominal 8-inch diameter intermediate casing commenced on 21 October 2014 to a depth of 469 feet. Cement-bentonite grout was mixed onsite and installed via tremie pipe from approximately 30 to 463 feet. Gravel, fine sand, and neat cement were installed from 30 feet to land surface.

The 7%-inch bedrock borehole drilling commenced on 21 October 2014 from 469 feet and was completed at a depth of 640 feet on 22 October 2014.

Well completion field forms are included in Appendix B, an as-built well diagram for NSH-007 is included as Figure 3, and well construction details are summarized in Table I.

# 2.1.2 Geophysical Logging

A geophysical logging survey of the open borehole interval of well NSH-007 was conducted by IDS-Colog on 26 October 2014; however, an obstruction in the borehole at approximately 510 feet prevented logging the entire borehole. The geophysical survey included the following logs:

- Caliper/Gamma/Temperature/Conductivity, and
- Acoustic Borehole Televiewer.

Two attempts were made to clear the obstruction in well NSH-007. On 11 November 2014, the borehole was cleaned out to the total depth; geophysical logging was attempted but the borehole had filled to approximately 515 feet.



The second attempt to clear the obstruction in well NSH-007 included installation of a PVC liner to facilitate the pumping test and is detailed in Section 2.1.4. No additional logs were run due to borehole instability. Copies of the geophysical logs are included in Appendix D.

# 2.1.3 Lithology

The bottom of the alluvium was penetrated at approximately 320 feet. The alluvium consists of clay with sand from land surface to approximately 20 feet, overlying sand with gravel to the bottom of the unit. The upper portion of alluvium (to approximately 130 feet) is comprised of approximately 50 percent granitic clasts and approximately 50 percent non-granitic clasts. The lithology of the granitic clasts is consistent with the Texas Canyon quartz monzonite and the non-granitic clasts are primarily sedimentary and metamorphic rocks. The lower portion of the alluvial unit is composed of approximately 85 percent granitic clasts and approximately 15 percent non-granitic clasts. There was no evidence of saturation in the alluvium.

The Martin Formation was encountered directly beneath the alluvium. The occurrence of groundwater was first noted at approximately 350 feet when no makeup water was utilized and a small amount of water discharge with the drilled cuttings was observed. An attempt was made to estimate the water level; however due to the low transmissivity and water production of the upper bedrock, the air rotary drilling method obscured the static water level during drilling. The Martin Formation was completely penetrated by the borehole and the top of the Upper Abrigo Formation was encountered at approximately 470 feet and extended to the total depth of the borehole. A detailed lithologic log is included in Appendix A.

## 2.1.4 Borehole Cleanout and Liner Installation

On 10 February 2015, NEWP mobilized to well NSH-007 with the 50k drilling rig and converted the tools to drill by the dual-tube reverse air-rotary drilling method to clean out the borehole for installation of a PVC liner. Cleanout activities commenced on 11 February 2015 and the obstruction was encountered from approximately 510 feet to 620 feet, with voids from 580 to 590 feet and 600 to 610 feet. Obstruction material appeared consistent with the lithology of the drilled cuttings from the Abrigo Formation. The borehole was deepened to approximately 640 feet to accommodate potential fill during installation of the liner. The borehole was airlifted until the discharge of drilling fluids was minimal and the concentration of cuttings in the discharge decreased significantly (to less than approximately 2 milliliters per liter [ml/L]) prior to removal of the drill bit. However after removal of the bit, the fill was measured at approximately 509 feet. On 12 February 2014, fill was measured at approximately 502 feet and an additional attempt was made to clean out the borehole using the same method. During cleanout, the driller noted significant return of cuttings from the 530- to 540-foot interval prior to reaching total depth. The borehole was circulated until the concentration of cuttings in the discharge decreased significantly (to approximately 0.3 ml/L) prior to removal of the drill bit. After removal of the bit, fill in the borehole was measured at approximately 500 feet.

Bentonite-based drilling fluid was added on 13 February 2015 to stabilize the borehole during cleanout to approximately 640 feet. The borehole remained open and a 4-inch nominal diameter PVC liner (schedule 40 wall thickness) was installed. The design of the liner included screened intervals (0.100-inch wide horizontal perforations) from approximately 356 to 496 feet and from 536 to 616 feet, with a bottom cap at approximately 616 feet. The blank interval of casing was installed between approximately 496 to 536 feet as an optional pump gallery due to potential fill re-entering the borehole. The well as-built diagram is included as Figure 3.



## 2.1.5 Well Development

Prior to conducting the geophysical logging of the open borehole interval, the borehole was developed by airlift for approximately 10 hours with the bit at the bottom of the borehole on 23 October 2014. The purpose of the borehole development was to improve the quality of data collected during the flow logging exercise. The discharge rate during airlift development was estimated at approximately 20 gallons per minute (gpm). The concentration of solids in the discharge generally decreased over the development period from approximately 25 to 5 ml/L, and appeared to have a lithology consistent with the drilled cuttings.

Additional development was conducted from 15 to 16 February 2015 after installation of the liner to remove drilling fluids required to install the liner. A submersible pump (Grundfos model 40S100-30) was installed to approximately 595 feet and purging of drilling fluids commenced. On 16 February 2015, pump development continued and the discharge was clear and generally sand free at the end of the day. The static water level was measured at approximately 346 feet prior to additional pump development by the pump and surge method, which included several hours of pumping at three rates (between approximately 4 and 15 gpm) with recovery periods between pumping. At the end of the development period, the discharge from NSH-007 was clear and free of sand. Field forms documenting well development are included in Appendix C.

## 2.2 WELL NSH-008

Well NSH-008 was sited at location NSH-CQ to characterize the interior of the structural block located between the Gibson, Sechura, and Little Sandy faults. Well NSH-008 is located on the opposite side of the Sechura fault from Well NSH-007. Well NSH-008 was planned for completion in the lower oxide bedrock with possible penetration of the Little Sandy fault. This well location is also sited at a shallow occurrence of the Abrigo.

Well NSH-008 is a 4-inch cased well and the planned depth of was 905 feet; the well was drilled by NEWP using the 50k drilling rig and the air rotary method.

# 2.2.1 Drilling and Well Installation

Drilling activities for well NSH-008 commenced on 24 October 2014. A 20-inch diameter borehole was drilled to 20 feet, LCS steel surface casing with a 12-inch nominal diameter was installed to 20 feet, and neat cement grout was installed from 20 feet to land surface.

Borehole drilling continued on 24 October 2014 using a 10-inch diameter air-rotary hammer bit to a depth of 900 feet. Installation of well NSH-008 commenced on 28 October 2014 after geophysical logging was completed. The well included 4-inch nominal diameter LCS; blank casing was installed to 720 feet and the screened interval extended from 720 to 840 feet. The filter pack was installed from the top of the fill to 711 feet, transition sand was installed to 700 feet, and installation of high-solids bentonite grout to land surface was completed on 30 October 2014.

On 20 November 2014, the level of the bentonite grout in the annulus was observed to have dropped to approximately 191 feet. The annulus was filled with %-inch bentonite chips from approximately 191 to 80 feet, and Tacna gravel was installed to land surface.



Well construction field forms are included in Appendix B, an as-built well diagram for NHS-008 is included as Figure 4, and well construction details are summarized in Table I.

## 2.2.2 Geophysical Logging

A geophysical logging survey of the NSH-008 borehole was conducted by IDS-Colog and commenced on 26 October 2014; however on 27 October 2014, a portion of the borehole collapsed at approximately 400 feet during logging. The borehole was cleaned out to the total depth the same day using the same drilling rig. The geophysical survey was completed 28 October 2014 and included the following logs:

- Caliper/Gamma/Temperature/Conductivity,
- Electrical Resistivity,
- Sonic,
- Acoustic Borehole Televiewer,
- Gamma-Gamma Density,
- Neutron, and
- Heat Pulse Flow-Meter.

The geologic logs collected were used in the interpretation of the lithology and were utilized by Excelsior to expand their geologic model. Interpretation of flow logging will be summarized in the aquifer testing report.

The heat pulse flow-meter was used due to lack of availability of the electromagnetic flow-meter to measure vertical flow of groundwater in the borehole. The heat-pulse tool collected data from 17 stationary positions (working downward) between approximately 350 and 854 feet. Slight upward flow (between approximately 0.2 and 0.9 gpm) was measured at approximately 603, 625, and 654 feet. Measurement of vertical flow in the borehole during injection was attempted; however, the heat pulse tool had been filled with solids from the borehole and prevented the tool from functioning as designed after the initial static downhole run. After logging was completed, the top of the fill was measured at approximately 854 feet. Copies of the geophysical logs are included in Appendix D.

## 2.2.3 Lithology

The bottom of the alluvium was encountered at approximately 310 feet. Penetration rates in the alluvium were generally between approximately 0.6 and 1.5 minutes per foot. The alluvium consists of clay with sand from land surface to approximately 30 feet, and overlying clayey sand to approximately 70 feet. Sand with gravel was encountered from approximately 70 feet to the bottom of the alluvium at 310 feet. The upper portion of alluvium, from approximately 70 to 130 feet, is comprised of approximately 50 to 70 percent granitic clasts and approximately 30 to 50 percent non-granitic clasts. The lithology of the granitic clasts is consistent with the Texas Canyon quartz monzonite and the non-granitic clasts are primarily sedimentary and metamorphic rocks. The lower portion of the alluvial unit (below approximately 130 feet) is comprised of approximately 90 percent granitic clasts and 10 percent non-granitic clasts.



The Martin Formation was encountered immediately below the alluvium at 310 feet to 460 feet. Penetration rates in the Martin Formation were generally between approximately 1.0 and 2.0 minutes per foot and no evidence of groundwater was observed.

The top of the Upper Abrigo Formation was encountered at approximately 460 feet to 490 feet. Penetration rates in the Upper Abrigo formation were between approximately 1.1 and 1.6 minutes per foot. Based on a change in lithology, the top of the Middle Abrigo formation was encountered at approximately 560 feet and penetration rates decreased (compared to the Upper Abrigo formation) to between approximately 1.5 and 4.6 minutes per foot. The occurrence of groundwater during drilling was first noted when drilling from 720- to 740-foot interval; no makeup water was being used and approximately 15 gpm of water discharged with the drilled cuttings. The penetration rate in this interval was approximately 1.0 minutes per foot, compared to the higher rates above and below this interval. These observations suggest the interval from 720 to 740 feet is consistent with an open feature such as a fracture zone. The Lower Abrigo was encountered at approximately 740 feet; penetration rates in the Lower Abrigo formation were between approximately 1.6 and 2.6 minutes per foot. The groundwater discharge rate during drilling did not increase with depth.

The Little Sandy fault was not penetrated by NSH-008. However, fracturing encountered between 719 and 765 feet has an orientation similar to the Sechura fault and may reflect a splay of that fault. A detailed lithologic log is included in Appendix A.

## 2.2.4 Well Development

After drilling to the total depth, the borehole was developed by airlift for approximately 6 hours with the bit at the bottom of the borehole on 26 October 2014. The discharge rate during airlift development was estimated at approximately 10 gpm. The concentrations of solids in the airlift discharge were generally consistent over the development period (between approximately 5 and 20 ml/L with approximately 20 to 30 percent gravel), and appeared consistent with the lithology of the drilled cuttings from bedrock. Airlift development of the borehole stopped when cuttings consistent with the alluvium were predominately observed in the discharge. After the bit was removed from the borehole, the water level was measured at 390 feet on 26 October 2014 and was observed to be slowly recovering. On 27 October 2014, the water level was measured at approximately 348 feet.

After installation of the well, tremie pipe was installed as an airline to airlift develop the well with the drilling rig. The well was airlift developed for a total of approximately 12 hours on 30 October 2014; the airline was initially installed to approximately 695 feet and was worked down to approximately 835 feet by the end of the development period. The discharge rate was approximately 15 gpm. The sand content, turbidity, and discharge rate did not appear to change during the development period.

Further development was conducted by NEWP using a pump rig. On 22 December 2014, the water level in well NSH-008 was measured at approximately 333 feet prior to development. A tightly fitting swab tool was reciprocated through the screened interval for approximately one hour and the solids were bailed prior to pumping. A Grundfos submersible pump (model 40S100-30) was installed with the intake at approximately 709 feet. Pump development was conducted; pump rates were initially low (approximately 7 gpm) and were increased gradually with each pumping period to a maximum rate of approximately 25 gpm. The discharge was clear and free of sand at the end of the 8-hour development period. Field forms documenting well development are included in Appendix C.



#### 2.3 WELL NSH-009

Well NSH-009 was sited at location NSH-CS to characterize the structural block located between the Gibson, Chihuahua, and Patagonia faults. Well NSH-009 is located on the opposite side of the Gibson fault from Well NSH-008, and was expected to intercept the steeply dipping Gibson fault at depth. The Gibson fault geometry is poorly constrained due to a lack of data. Well NSH-009 was planned for completion in the lower oxide bedrock.

Well NSH-009 is a 4-inch cased well design with a planned depth of 1,180 feet. It was drilled by NEWP using the 685 drilling rig and the air rotary method.

# 2.3.1 Drilling and Well Installation

Drilling activities for well NSH-009 commenced on 30 October 2014; a 20-inch diameter borehole was drilled to 20 feet, LCS casing with a 12-inch nominal diameter was installed to 20 feet, and neat cement grout was installed from 20 feet to land surface.

Borehole drilling continued from 31 October 2014 to 3 November using a 10-inch diameter air-rotary hammer bit to 1,060 feet. Installation of well NSH-009 commenced on 4 November 2014 after geophysical logging was completed. The well included 4-inch nominal diameter LCS; blank casing was installed to 813 feet and the screened interval extended from 813 to 995 feet. Installation of annular materials commenced on 7 November 2014. Filter pack was installed to approximately 795 feet, transition sand was installed to approximately 785 feet, and high solids-bentonite grout was installed to land surface on 8 November 2014.

The top of the high-solids bentonite grout in the annulus was observed to have dropped to approximately 590 feet by 23 November 2014. Additional high-solids bentonite grout was installed to 353 feet, bentonite chips were installed to 337 feet, Tacna gravel was installed to 6 feet, and bentonite chips were installed to land surface.

Well construction field forms are included in Appendix B, an as-built well diagram for NSH-009 is included as Figure 5, and well construction details are summarized in Table I.

# 2.3.2 Geophysical Logging

A geophysical logging survey of the borehole for well NSH-009 was conducted by Colog and commenced on 3 November 2014. Prior to logging, the water level was measured at approximately 563 feet. The geophysical survey was completed 4 November 2014 and included the following logs:

- Caliper/Gamma/Temperature/Conductivity,
- Electrical Resistivity,
- Sonic,
- Acoustic Borehole Televiewer,
- Gamma-Gamma Density,
- Neutron, and
- Static and dynamic electromagnetic flow-meter.



The geologic logs collected were used in the interpretation of the lithology for the final well design and were utilized by Excelsior to expand their geologic model. Interpretation of flow logging will be summarized in the aquifer testing report. Copies of the geophysical logs are included in Appendix D.

# 2.3.3 Lithology

The alluvium consists of clay and sandy silt from land surface to approximately 40 feet; overlying sand with silt and gravel and silt with sand to the bedrock contact at approximately 480 feet. Penetration rates in the alluvium were generally between approximately 0.3 and 1.5 minutes per foot. The upper portion of alluvium (from approximately 60 to 110 feet) is comprised of approximately 75 to 80 percent granitic clasts and approximately 20 to 25 percent non-granitic clasts. The lithology of the granitic clasts is consistent with the Texas Canyon quartz monzonite and the non-granitic clasts are primarily sedimentary and metamorphic rocks. The lower portion of the alluvial unit (below approximately 10 feet) is comprised of approximately 80 to 90 percent granitic clasts and approximately 10 to 20 percent non-granitic clasts.

The Escabrosa Formation was encountered beneath the alluvium at approximately 480 feet. Drilled cuttings from the Escabrosa Formation appeared white and minor concentrations of iron oxides were noted. The Martin Formation was encountered from approximately 520 to 660 feet, appeared gray to white in color, and included concentrations of copper and iron oxide minerals. Penetration rates in the Escabrosa and Martin formations were generally between approximately 1.0 and 2.4 minutes per foot; no evidence of groundwater was observed during drilling.

The top of the Upper Abrigo Formation was encountered from approximately 660 to 790 feet. Penetration rates in the Upper Abrigo Formation were between approximately 0.9 and 1.5 minutes per foot. Based on a change in lithology, the top of the Middle Abrigo Formation was encountered at approximately 790 feet and penetration rates decreased (compared to the Upper Abrigo Formation) to between approximately 1.6 and 5.3 minutes per foot. The Lower Abrigo Formation was encountered at approximately 1,000 feet. Penetration rates in the Lower Abrigo Formation were between approximately 2.0 and 4.0 minutes per foot. Well NSH-009 was planned for a depth of 1,180 feet, but drilling was terminated at a depth of 1,060 feet in the Lower Abrigo due to the fact that mineralogical interpretation by Excelsior staff indicated that the bottom of the oxide had been reached and the hole was advancing into the non-mineralized sub-ore body zone. The Gibson fault was not intercepted by Well NSH-009. A detailed lithologic log is included in Appendix A.

# 2.3.4 Well Development

Development of well NSH-009 was conducted by NEWP and included swabbing, bailing, and pumping. Prior to development, the water level was measured at approximately 406 feet on 22 December 2014. A tightly-fitting swab tool was reciprocated on a wireline through the screened interval for approximately 2 hours and the solids were bailed from the well.

Well NSH-009 was developed by pumping on 3 and 4 January 2015. Prior to development, the static water level was measured at approximately 407 feet. NEWP installed a Grundfos submersible pump (model 40S100-30) with the intake at approximately 595 feet. Pump and surge development on 3 January 2015 extended for approximately 2 hours and included 20- to 30-minute pumping periods and 10-minute recovery periods. Purge rates were initially high (approximately 40 gpm) and were allowed



to decrease as the pumping water level dropped. The pump was lowered to approximately 742 feet to accommodate more drawdown. Pump development on 4 January 2015 included pumping for a total of approximately 4 hours and pumping periods at approximately 7 and 10 gpm. Field forms documenting well development are included in Appendix C.

#### 2.4 WELL NSH-010

Well NSH-010 was sited at location NSH-CT to characterize the structural block located between the Gibson, Chihuahua, and Patagonia faults. Well NSH-010 was planned for completion in the upper oxide bedrock, with no fault intercepts.

Well NSH-010 is an open borehole interval well with a planned depth of 750 feet; the well was drilled by NEWP using the 50k drilling rig, and the air rotary method. Upon completion, a PVC liner was installed to stabilize the open interval; details are included in Section 2.4.4.

# 2.4.1 Drilling and Casing Installation

Drilling activities for well NSH-010 commenced on 30 October 2014; a 20-inch borehole was drilled to 20 feet, an LCS casing with a 14-inch nominal diameter was installed to 20 feet, and neat cement grout was installed from 20 feet to land surface.

Borehole drilling continued from 31 October to 1 November 2014 using a 13-inch diameter air-rotary hammer bit to 546 feet. Installation of the 8-inch nominal diameter LCS intermediate casing was completed on 1 November 2014, neat cement grout was installed to approximately 486 feet, and high-solids bentonite grout was installed to land surface.

Bedrock borehole drilling commenced on 2 November 2014 using a 7%-inch air-rotary hammer bit; the borehole was completed on 3 November 2014 to a depth of 720 feet.

Well completion field forms are included in Appendix B, an as-built well diagram is included as Figure 6, and construction details are summarized in Table I.

## 2.4.2 Geophysical Logging

A geophysical logging survey of open borehole interval of well NSH-010 was conducted by IDS-Colog on 4 November 2014; however, an obstruction in the borehole at approximately 660 feet prevented logging the entire borehole. The geophysical survey included the following logs:

- Caliper/Gamma/Temperature/Conductivity,
- Electrical Resistivity, and
- Sonic.

The geologic logs collected were used in the interpretation of the lithology and were utilized by Excelsior to expand their geologic model. Interpretation of flow logging will be summarized in the aquifer testing report. Copies of the geophysical logs are included in Appendix D.



# 2.4.3 Lithology

The borehole penetrated the bottom of the alluvium at approximately 490 feet. Penetration rates in the alluvium were generally between approximately 0.5 and 1.2 minutes per foot, but rates as slow as 2.25 minutes per foot were observed over short intervals. The alluvium consists of sandy lean clay with gravel from land surface to approximately 10 feet, silty sand with gravel from approximately 10 to 40 feet, sand with silt and gravel from approximately 40 feet to 70 feet, sand with gravel from approximately 70 feet to 180 feet, silty sand from approximately 180 feet to 230 feet, and sand with silt from 230 feet to 490 feet. There was no evidence of saturation in the alluvium.

The Escabrosa Formation was completely penetrated by the borehole, and the top of the Martin Formation was encountered at approximately 610 feet. Penetration rates in bedrock were between approximately 0.6 and 1.75 minutes per foot to a total depth of approximately 720 feet in the Martin Formation. Fault gouge was observed in the drilled cuttings at approximately 620 feet, which was interpreted to be a minor fault along the bedding plane between the Escabrosa and the Martin formations. A detailed lithologic log is included in Appendix A.

#### 2.4.4 Borehole Clean Out and Liner Installation

On 14 February 2015, NEWP mobilized to well NSH-010 with the 50k drilling rig. Initially, the dual-tube reverse air-rotary drilling method was used to clean out the borehole to total depth from the top of obstruction at approximately 610 feet. Initial discharge was described as bentonite grout fluids and bentonite solids with drilled cuttings consistent with the bedrock lithology. After the initial cleanout, an obstruction in the borehole was measured at approximately 600 feet on 15 February 2015 and the well was cleaned out to total depth using the same drilling method. However, another obstruction was measured at approximately 620 feet after the second cleanout. On 16 February 2015, NEWP changed to the conventional direct air-rotary drilling method to clean out the borehole using stiff foam drilling fluid; however, the obstruction was measured at approximately 608 feet after cleanout activities. On 17 February 2015, the rig was converted to drill by the dual-tube reverse air-rotary method and bentonite-based drilling fluid was used to stabilize the borehole to total depth during cleanout. After removing the bit, the borehole was open past the previous obstructions and installation of the liner commenced.

A 6-inch nominal diameter PVC liner (schedule 40 wall thickness) was installed on 17 February 2015 to a depth of approximately 699 feet. The design of the liner included screened intervals (0.100 inch-wide horizontal perforations) from approximately 379 to 599 feet and from 639 to 699 feet with a PVC bottom cap. A blank interval of casing was installed between approximately 599 and 639 feet as an optional pump gallery to protect pump equipment due to potential fill re-entering the borehole. An asbuilt diagram for NSH-010 is included as Figure 6.

## 2.4.5 Well Development

After drilling to the total depth, the borehole was developed by airlift for approximately 3 hours with the bit at the bottom of the borehole on 3 November 2014. The concentration of solids in the discharge generally increased over the development period from approximately 30 to 120 ml/L, with the high concentration of 200 ml/L. The solids appeared consistent with the lithology of the bedrock drilled cuttings. After airlift development, the water level was observed to slowly recover from approximately 579 feet to approximately 558 feet on 4 November 2014.



Well development included installation of a submersible pump (Grundfos model 40S100-30) to approximately 675 feet on 5 March 2015. The water level prior to development was 552 feet and the initial discharge was bentonite-based drilling fluid. Water was added to the well to thin the fluids while pumping. Development also included several pumping and recovery periods. At the end of the day, the pumping water level was approximately 655 feet at a discharge rate of approximately 1 gpm. On 6 March 2015, the static water level was approximately 567 feet prior to development activities which included pumping and recovery periods. Generally, pumping water levels were approximately 655 feet after 30 minutes of pumping and the discharge rate had reduced from approximately 5 gpm to less than 1 gpm over the pumping period. The discharge was clear and free of sand at the end of the development period.

Additional development was conducted at NSH-010 using chemical dispersants on 16 April 2015. NEWP added approximately 1.75 gallons of chemical dispersant (AquaClear PFD manufactured by Baroid) to the well, then added approximately 200 gallons of water. The chemical dispersant was distributed in the well by swabbing; after swabbing, the well was pumped at 4 gpm for 6 hours. Field forms documenting well development are included in Appendix C.

## 2.5 WELL NSH-011

Well NSH-011 was primarily sited for the purpose of identifying alluvial lithology and the depth to bedrock east of the mineralized area. The secondary purpose of NSH-011 was the installation of an alluvial piezometer to monitor water levels in this region. Well NSH-011 was planned for completion at a depth of 720 feet. Excelsior provided oversight for the drilling and installation of NSH-011 which was drilled to a depth of 602 feet. Based on Excelsior records, bedrock was encountered at approximately 545 feet and NSH-011 was completed as a nominal 2-inch piezometer to a total depth of 540 feet with a screened interval from 500 to 540 feet.

Geophysical logging was conducted by IDS-Colog on 4 November 2014 prior to installation of the well and included the following logs:

- Caliper/Gamma/Temperature/Conductivity;
- Electrical Resistivity; and
- Sonic.

The well was developed by the bailer method by Haley & Aldrich staff on 29 and 30 April 2015. Depth to water prior to development was approximately 494 feet. A total of approximately 24 gallons was purged from the well. Field forms documenting well development are included in Appendix C.

Copies of the geophysical logs are included in Appendix D.

#### 2.6 WELL NSH-012

Well NSH-012 was sited at location NSH-CU for the purpose of characterizing groundwater conditions in the alluvium in the northeastern area of the North Star Deposit.

Well NSH-012 is a 4-inch cased well with a planned depth of 445 feet; the well was drilled by NEWP using the 50k drilling rig and the air rotary method.



## 2.6.1 Borehole Drilling and Well Installation

Drilling activities for well NSH-012 commenced on 3 November 2014. A 20-inch diameter borehole was drilled to 20 feet, LCS surface casing with a 14-inch nominal diameter was installed to 20 feet, and neat cement grout was installed from 20 feet to land surface.

Borehole drilling continued on 9 November 2014 using a 10-inch diameter air-rotary hammer bit to 504 feet. Installation of well NSH-012 was conducted on 10 November 2014 after geophysical logging was completed. The well included 4-inch nominal diameter LCS blank casing installed to 430 feet and the screened interval extended from 430 to 490 feet. Filter pack was installed from the bottom of the borehole to 422 feet, transition sand was installed to 409 feet, and high-solids bentonite grout was installed to land surface.

The top of the high-solids bentonite grout had dropped to approximately 220 feet by 20 November 2014. To complete the well, bentonite chips and high-solids bentonite grout were installed to land surface.

Well completion field forms are included in Appendix B, an as-built well diagram is included as Figure 7, and construction details are summarized in Table I.

# 2.6.2 Geophysical Logging

A geophysical logging survey was conducted by IDS-Colog at well NSH-0012 on 10 November 2014 and included the following logs:

Caliper/Gamma.

The geologic logs collected were used in the interpretation of the lithology and were utilized by Excelsior to expand their geologic model. Interpretation of flow logging will be summarized in the aquifer testing report. Copies of the geophysical logs are included in Appendix D.

# 2.6.3 Lithology

The alluvium consists of primarily sand and gravel from land surface to approximately 502 feet overlying the Escabrosa Formation; the total depth of the borehole was 504 feet. Penetration rates in the alluvium were generally between approximately 0.3 and 2.0 minutes per foot. No water was observed during drilling activities. A detailed lithologic log is included in Appendix A.

## 2.6.4 Well Development

Development of well NSH-012 was conducted by NEWP and included bailing. Approximately 2 gallons of fluid was bailed from the well on 22 December 2014. No groundwater was observed in the well. The observations made at this location indicate that the water observed at higher elevations in nearby wells is likely fed by a deeper source of groundwater with a higher piezometric head. Field forms documenting well development are included in Appendix C.



#### 2.7 WELL NSH-013

Well NSH-013 was sited at location NSH-BW to expand the existing cluster of wells (NSH-003 and NSH-006) located in the structural block between the Mojave #1, Patagonia, Atacama, and Forty Mile faults. Well NSH-013 was planned as an upper oxide bedrock test well and was expected to intercept the Mojave #1 fault.

NSH-013 is an open borehole interval well with a planned depth of 1,135 feet, and was drilled by NEWP using the 50k drilling rig and the air-rotary method.

# 2.7.1 Drilling and Casing Installation

Drilling activities for well NSH-013 commenced on 4 November 2014. A 20-inch diameter borehole was drilled to 20 feet, LCS surface casing with a 14-inch nominal diameter was installed to 20 feet, and neat cement grout was installed from 20 feet to land surface.

Borehole drilling continued on 4 November 2014 using a 13-inch diameter air-rotary hammer bit to 650 feet. The 8-inch nominal diameter LCS intermediate casing was installed to approximately 646 feet on 5 November 2014. Neat cement grout was installed from approximately 597 to 646 feet and high-solids bentonite grout was installed to land surface. The casing installation was completed on 6 November 2014.

Bedrock drilling commenced on 7 November 2014. The borehole was drilled with a 7%-inch hammer bit to a total depth of approximately 1,070 feet, and was completed on 7 November 2014.

On 13 December 2014, the level of the cement in the annulus was observed to have dropped to approximately 75 feet. The annulus was filled with %-inch bentonite chips to approximately 67 feet and Tacna gravel was installed to surface.

Well completion field forms are included in Appendix B, an as-built well diagram is included as Figure 8, and construction details are summarized in Table I.

## 2.7.2 Geophysical Logging

A geophysical survey of the open borehole interval of well NSH-013 was conducted by IDS-Colog from 7 to 8 November 2014. The geophysical survey included the following logs:

- Caliper/Gamma/Temperature/Conductivity,
- Sonic,
- Electrical Resistivity,
- Acoustic Borehole Televiewer,
- Gamma-Gamma Density, and
- Neutron.

After completion of the initial set of geophysical logs, equipment was set up for flow testing of the borehole. Ambient flow meter testing was performed using a corehole dynamic flow-meter (CDFM) tool. Injection was started at approximately 9 gpm and continued for approximately 3 hours. The well



was then allowed to recover for approximately 1.5 hours. The flow logging survey included the following logs:

- CDFM Ambient, and
- CDFM Injection (9.55 gpm).

The geologic logs collected were used in the interpretation of the lithology and were utilized by Excelsior to expand their geologic model. Interpretation of flow logging will be summarized in the aquifer testing report. Copies of the geophysical logs are included in Appendix D.

## 2.7.3 Lithology

The borehole penetrated the bottom of the alluvium at approximately 600 feet. Penetration rates in the alluvium were generally between approximately 0.5 and 1.2 minutes per foot. The alluvium consists of gravel with clay and sand from land surface to approximately 600 feet. The upper portion of alluvium (to approximately 290 feet) is comprised of approximately 50 percent granitic clasts and approximately 50 percent non-granitic clasts. The lithology of the granitic clasts is consistent with the Texas Canyon quartz monzonite, and the non-granitic clasts are primarily sedimentary and metamorphic rocks. The lithology of the lower alluvium is primarily granitic. During drilling of the borehole for the intermediate casing, there was no evidence of saturation in the alluvium.

The Martin Formation was penetrated from 600 to 800 feet overlying an interval of the Escabrosa Formation to approximately 840 feet. The Martin Formation was observed again from approximately 840 to 950 feet overlying an interval of the Texas Canyon quartz monzonite from approximately 950 to 1,000 feet. The Martin Formation was observed again from approximately 1,000 to 1,070 feet and included a short interval of the Texas Canyon quartz monzonite from 1,050 to 1,060 feet. Penetration rates in the bedrock were relatively consistent between approximately 1.0 and 1.8 minutes per foot. Well NSH-013 intercepted the Mojave #1 fault at approximately 840 to 850 feet. A detailed lithologic log is included in Appendix A.

# 2.7.4 Well Development

After drilling to the total depth, the borehole was briefly developed by airlift with the bit approximately 20 feet off the bottom of the borehole on 7 November 2014. The amount of solids in the discharge was minor, and decreased over each development cycle from approximately 1.9 ml/L to less than 0.1 ml/L.

On 12 January 2015, NEWP installed a submersible pump (Grundfos, model 40S 100-30) to approximately 747 feet. The well was initially purged at approximately 20 gpm for approximately 2 hours resulting in a drawdown of approximately 90 feet. Following the initial purge, the well was repeatedly pumped and allowed to recover. The well was developed by pumping for a total of approximately 3 hours on 12 January 2015. At the end of the pumping, the discharge was generally clear with trace solids; however, additional pump development with a larger pump was recommended to Excelsior.

On 22 February 2013, additional pump development was conducted with a larger pump (Grundfos, model 85S 200-18) installed to approximately 869 feet. Pump development consisted of pumping at approximately 20 gpm; recovery for 15 minutes; pumping at 30 gpm for 45 minutes; recovery for 15 minutes; pumping at 40 gpm again for 45 minutes. The total drawdown at the end of the pumping was approximately 201 feet. Field forms documenting well development are included in Appendix C.



#### 2.8 WELL NSH-014

Well NSH-014 was sited at location NSH-DN to characterizing the interior of the structural block located between the Gibson, Chihuahua, and Patagonia faults, and was planned for completion in the sulfide zone below the oxide bedrock. The initial borehole for well NSH-014 was abandoned due to equipment failure and replaced by well NSH-014B at approximately the same location.

NEWP used the 685 drilling rig for drilling and well installation activities.

## 2.8.1 Borehole Drilling and Abandonment

Drilling activities for NSH-014 commenced on 8 November 2014. A 20-inch diameter borehole was drilled to 20 feet, LCS surface casing with a 12-inch nominal diameter was installed to 20 feet, and neat cement grout was installed from 20 feet to land surface.

Borehole drilling for NSH-014 continued on 8 November 2014 using a 10-inch diameter air-rotary hammer bit which penetrated the bottom of the alluvium at approximately 480 feet. The borehole could not be advanced deeper than approximately 740 feet on 9 November 2014 and the tools were removed for inspection. The drill bit had separated from the hammer; NEWP attempted to remove the drill bit without success and abandoned the borehole on 10 November 2014. The borehole for NSH-014 was abandoned by the installation of high-solids bentonite grout and neat cement by NEWP on 10 November 2014 as directed by Excelsior.

## 2.8.2 Lithology

Penetration rates in the alluvium were generally between approximately 0.3 and 0.6 minutes per foot. The alluvium consists of clay with gravel and sand from land surface to approximately 50 feet overlying gravel with sand to approximately 480 feet. The alluvial lithology is primarily comprised of clasts consistent with the Texas Canyon quartz monzonite; non-granitic alluvial clasts include primarily sedimentary and metamorphic rocks.

Borehole drilling continued and the Martin Formation was fully penetrated from approximately 490 to 645 feet. Drilled cuttings from the Escabrosa Formation include gray dolomite and limestone with magnetite-bearing tactite and include copper and iron oxide minerals. The Upper Abrigo Formation was encountered at approximately 645 feet, appeared green to white in color, and included concentrations of copper and iron oxide minerals. Penetration rates in the Escabrosa and Martin formations were generally between approximately 0.7 and 1.7 minutes per foot and no evidence of groundwater was observed during drilling.

#### 2.9 WELL NSH-014B

Well NSH-014B was sited adjacent to the abandoned NSH-014 as a replacement for the lost hole and was drilled for the same purpose as Well NSH-014. NSH-014 is 4-inch cased well with a planned depth of 1,135 feet, and was drilled by NEWP using the 685 drilling rig and the air and mud-rotary methods.



## 2.9.1 Drilling and Well Installation

Drilling activities for well NSH-014B commenced on 10 November 2014. A 20-inch diameter borehole was drilled to 20 feet, LCS surface casing with a 12-inch nominal diameter was installed to 20 feet, and neat cement grout was installed from 20 feet to land surface.

Drilling commenced with a 10-inch air rotary hammer bit on 10 November 2014; borehole instability observed on 12 November 2014 required the use of the mud rotary drilling method with 9%-inch tri-cone bit from approximately 1,002 feet to the target depth.

Installation of well NSH-014B was completed on 21 November 2014 after geophysical logging. The well included 4-inch nominal diameter LCS; blank casing installed to 1,180 feet and the screened interval extended from 1,180 to 1,260 feet. Filter pack was installed to approximately 1,170 feet, transition sand to approximately 1,160 feet, and high-solids bentonite grout was installed to land surface.

The top of the high-solids bentonite grout in the annulus was observed to have dropped to approximately 65 feet on 23 November 2014. A 5-foot interval of bentonite chips was installed to 60 feet and alternating layers of pea gravel, Tacna gravel and bentonite chips were installed to land surface.

Well completion field forms are included in Appendix B, an as-built well diagram is included as Figure 9, and construction details are summarized in Table I.

## 2.9.2 Geophysical Logging

A geophysical logging survey of the borehole for well NSH-014B was conducted by IDS-Colog on 11 November 2014. Prior to logging, the water level was measured at approximately 563 feet. The geophysical survey was completed 4 November 2014 and included the following logs:

- Caliper/Gamma/Temperature/Conductivity,
- Electrical Resistivity, and
- Sonic.

The geologic logs collected were used in the interpretation of the lithology and were utilized by Excelsior to expand their geologic model. Interpretation of flow logging will be summarized in the aquifer testing report. Copies of the geophysical logs are included in Appendix D.

## 2.9.3 Lithology

The alluvium lithology was the same as encountered in the adjacent NSH-014. The top of the Martin Formation was encountered at approximately 490 feet and included gray dolomite with magnetite-bearing tactite to approximately 645 feet. The Upper Abrigo, which included green amphibole-chlorite tactite/hornfels with iron oxide minerals, was encountered from 645 to 960 feet. Penetration rates in the Martin and Upper Abrigo formations were between approximately 0.9 and 1.9 minutes per foot.

Based on a change in lithology to a brown garnet-epidote tactite, the top of the Middle Abrigo Formation was interpreted at approximately 960 feet. The Lower Abrigo Formation, consisting of primarily black-colored hornfels with abundant quartz veins and minor to moderate amounts of iron



oxides, was encountered at 1,000 feet. Due primarily to the change in the drilling method at 1,000 feet, penetration rates decreased (compared to the Upper Abrigo Formation) to between approximately 3 and 48 minutes per foot to a total depth of approximately 1,277 feet on 19 November 2014. A detailed lithology log is included in Appendix A.

## 2.9.4 Well Development

After installation of well NSH-014B, the heavy mud in the borehole was purged by NEWP by airlift and a dispersant (Baroid AquaClear PFD) was added to the well to break down the remaining drilling fluids. Additional airlift development was conducted by BJ Drilling between 9 January 2015 and 12 January 2015; the airline was installed to approximately 1,100 feet and the well was purged to the bottom of the airline followed by slow recovery. Field forms documenting well development are included in Appendix C.

#### 2.10 WELL NSH-015

Well NSH-015 was sited at location NSH-CJ to characterize the Black Rock fault, a significant north-south trending structural feature that is otherwise poorly constrained on-site. Well NSH-015 was planned for completion in the upper bedrock with the intention of penetrating the Black Rock fault at a depth of approximately 600 feet.

NSH-015 was planned and completed as an open borehole well design with a planned depth of 817 feet, and was drilled by NEWP using the 50k drilling rig and the air-rotary method.

# 2.10.1 Drilling and Casing Installation

Drilling activities for well NSH-015 commenced on 11 November 2014. A 20-inch diameter borehole was drilled to 20 feet, LCS surface casing with a 14-inch outside diameter (0.25-inch wall thickness) was installed to 20 feet, and neat cement grout was installed from 20 feet to land surface.

Borehole drilling continued on 12 November 2014 using a 12-inch diameter air-rotary hammer bit to approximately 585 feet. The intermediate 8%-inch outside diameter LCS casing (0.25-inch wall thickness) was installed to approximately 585 feet on 13 November 2014. After the casing was installed, neat cement grout was installed from approximately 514 feet to 577 feet, and high-solids bentonite grout was installed from 514 feet to land surface. The casing installation was completed on 14 November 2014.

Drilling of the 7%-inch borehole into bedrock commenced on 14 November 2014 and was drilled to a total depth of approximately 820 feet.

On 24 November 2014, the level of the bentonite grout in the annulus was observed to have dropped to approximately 85 feet. Bentonite chips were installed to 82 feet and %-inch pea gravel was installed to land surface.

Well completion field forms are included in Appendix B, an as-built well diagram is included as Figure 10, and construction details are summarized in Table I.



## 2.10.2 Geophysical Logging

Geophysical logging of the open borehole interval of well NSH-015 was conducted by IDS-Colog on 15 November 2014. The geophysical survey included the following logs:

- Caliper/Gamma/Temperature/Conductivity,
- Sonic,
- Electrical Resistivity,
- Acoustic Borehole Televiewer,
- · Gamma-Gamma Density, and
- Neutron.

After completion of the initial set of geophysical logs, equipment was set up on site for flow testing. Ambient flow-meter testing was performed with a spinner flow meter tool. Injection started at approximately 7.4 gpm and was increased up to 11 gpm. The water level could only be raised approximately 2.7 feet. Flow logging was postponed so that a higher capacity pump could be used to increase the rate of injection. On 21 November 2014, dynamic flow logging resumed with an injection rate goal of 50 gpm. Four runs using the spinner tool were conducted with injection rates ranging from 36 gpm to 40 gpm.

CDFM: Ambient, and

Spinner: Injection (40 gpm).

The geologic logs collected were used in the interpretation of the lithology and were utilized by Excelsior to expand their geologic model. Interpretation of flow logging will be summarized in the aquifer testing report. Copies of geophysical logs are included in Appendix D.

# 2.10.3 Lithology

The borehole penetrated the bottom of the alluvium at approximately 370 feet. Penetration rates in the alluvium were between approximately 0.4 and 1.3 minutes per foot. The alluvium consists of sand with gravel from land surface to approximately 370 feet. The upper portion of alluvium (to approximately 240 feet) is comprised of approximately 50 percent granitic clasts and approximately 50 percent nongranitic clasts. The lithology of the granitic clasts is consistent with the Texas Canyon quartz monzonite, and the non-granitic clasts are primarily sedimentary and metamorphic rocks. The lithology of the lower alluvium is primarily granitic.

The Texas Canyon quartz monzonite was encountered underlying the alluvium at approximately 370 feet and extended to approximately 800 feet. Below the Texas Canyon quartz monzonite, the Middle Abrigo Formation extended to the total borehole depth of 820 feet. Penetration rates in the bedrock ranged between approximately 0.8 to 2.2 minutes per foot. A detailed lithologic log is included in Appendix A.

The Black Rock fault was not intersected in the NSH-015 borehole and subsequent review of the geologic model indicates that the anticipated location of the fault plane may be offset east of the NSH-015, NSH-016, NSH-017 cluster.



## 2.10.4 Well Development

Pump development was conducted at NSH-015 on 10 January 2014. NEWP installed a submersible pump (Grundfos, model 40S 100-30) to approximately 653 feet. The well was initially purged at approximately 30 gpm for approximately 2.5 hours. The pump was shut off and the well was allowed to recover for approximately 10 minutes. The pump was turned on for a second time and allowed to pump for 10 more minutes. On 13 February 2013, 4 hours of airlift development was conducted by BJ Drilling primarily to evaluate borehole stability. Field forms documenting well development are included in Appendix C.

#### 2.11 WELL NSH-016

Well NSH-016 was sited at location NSH-CJ to characterize the porphyry quartz monzonite west of the Black Rock fault.

NSH-016 was planned and completed as an open borehole well design with a planned depth of 820 feet and was drilled by NEWP using the 50k drilling rig and the air-rotary method. Upon completion, a PVC liner was installed to stabilize the open interval; details are included in Section 2.11.4.

# 2.11.1 Drilling and Casing Installation

Drilling activities for well NSH-016 commenced on 15 November 2014. A 20-inch diameter borehole was drilled to 20 feet, LCS surface casing with a 14-inch outside diameter (0.25-inch wall thickness) was installed to 20 feet, and neat cement grout was installed from 20 feet to land surface.

Borehole drilling was continued on 15 November 2014 using a 12%-inch diameter air-rotary hammer bit to a depth of approximately 580 feet on 16 November 2014.

The intermediate 8%-inch outside diameter (0.25-inch wall thickness) LCS casing was installed to 580 feet on 16 November 2014. Prior to installation of the casing, bentonite chips were installed in the borehole from approximately 571 to 580 feet. Neat cement grout was installed in the annulus from 523 to 571 feet, and high-solids bentonite grout was installed from approximately 523 feet to land surface.

Bedrock borehole drilling commenced on 18 November 2014 using a 7%-inch air-rotary hammer bit; the borehole was completed to a depth of 820 feet on 19 November 2014.

On 24 November 2014, the level of the cement-bentonite grout in the annulus was observed to have dropped to approximately 90 feet. The annulus was filled with %-inch bentonite chips to approximately 4 feet and %-inch pea gravel was installed to surface.

Well completion field forms are included in Appendix B, an as-built well diagram is included as Figure 11, and construction details are summarized in Table I.

#### 2.11.2 Geophysical Logging

Geophysical logging of the open borehole interval at well NSH-016 was conducted by IDS-Colog and started 19 November 2014. The total depth reached by logging tools was 815 feet. The geophysical survey included the following logs:

Caliper/Gamma/Temperature/Conductivity,



- Sonic,
- Electrical Resistivity,
- Acoustic Borehole Televiewer, and
- CDFM Ambient.

After completion of the initial geophysical logging, equipment was set up on site for flow testing. Ambient flow meter testing was performed with a CDFM tool; dynamic flow testing was performed using a spinner tool. Injection was started at approximately 80 gpm for dynamic flow logging with spinner tool. The spinner tool was not functioning correctly and dynamic flow logging was on hold till 21 November 2015. When dynamic flow logging commenced, the tooling was unable to get past 694 feet due to a blockage and dynamic flow logging was not completed.

The geologic logs collected were used in the interpretation of the lithology and were utilized by Excelsior to expand their geologic model. Interpretation of flow logging will be summarized in the aquifer testing report. Copies of the geophysical logs are included in Appendix D.

## 2.11.3 Lithology

The borehole penetrated the bottom of the alluvium at approximately 400 feet. Penetration rates in the alluvium were between approximately 0.5 and 1 minute per foot, but rates as slow as 1.4 minutes per foot were observed over short intervals. The alluvium consists of clayey sand from land surface to approximately 30 feet, sand with gravel from 30 feet to 260 feet, and sand 260 feet to 400 feet. There was no evidence of saturation in the alluvium.

The Texas Canyon quartz monzonite was encountered underlying the alluvium and was the only formation encountered. Penetration rates in bedrock were between approximately 0.8 and 2.0 minutes per foot to a total depth of approximately 820 feet in the Texas Canyon quartz monzonite. Although groundwater was observed during drilling, the water level was difficult to estimate due to the drilling method. The discharge rate of groundwater was not observed to increase significantly with depth. A detailed lithologic log is included in Appendix A.

## 2.11.4 Borehole Cleanout and Liner Installation

On 18 February 2015, NEWP mobilized to well NSH-016 with the 50k drilling rig and used several methods to clean out the borehole which had an obstruction at 690 feet. During cleanout, the obstruction material appeared consistent with the lithology of the drilled cuttings from the Texas Canyon quartz monzonite, small porphyry gravels. Borehole was cleaned down to the original total depth of 820 feet.

After NEWP tripped all tooling out of the borehole, IDS-Colog ran a caliper log of the borehole and the bottom of the borehole was tagged at 810 feet with caliper tool. During installation of the PVC liner, the borehole had collapsed and the liner could not be installed past 710 feet. On 19 February 2015, the liner installation was completed. The design of the liner included screened intervals (0.100 inch-wide horizontal perforations) from approximately 301 to 601 feet and from 641 to 701 feet, with a bottom cap at approximately 701 feet. The blank interval of casing was installed between approximately 601 and 641 feet as an optional pump gallery due to potential fill re-entering the borehole. The well as-built diagram for NSH-016 is included as Figure 11.



## 2.11.5 Well Development

Pump development was conducted on 11 January 2015. Prior to pumping, the static water level was approximately 601 feet. The maximum pumping rate was approximately 34 gpm with a total drawdown of approximately 7 feet.

Airlift development was conducted on 23 January 2015 primarily to test the stability of the open borehole interval. With the airline installed to approximately 740 feet, discharge reached a rate of approximately 30 gpm with the returned sample consisting of approximately half sand and half gravel. Airline was raised to 680 feet with discharge rates reaching 10 gpm. Field forms documenting well development are included in Appendix C.

#### 2.12 WELL NSH-017

Well NSH-017 was sited at location NSH-CK to characterize the interior of the structural block and the metasedimentary rocks between the Black Rock and Sonora faults, south of the Atacama fault. NSH-017 is a 6-inch cased well design with a planned depth of 1,230 feet, and was drilled by NEWP using the 50k drilling rig and the air-rotary method.

## 2.12.1 Borehole Drilling and Well Installation

Drilling activities for well NSH-017 commenced on 19 November 2014. A 20-inch diameter borehole was drilled to a depth of 20 feet, LCS surface casing with a 14-inch nominal diameter was installed to 20 feet, and neat cement grout was installed to land surface.

Borehole drilling continued on 20 November 2014 using a 12-inch diameter air-rotary hammer bit which was replaced by an 11%-inch tri-cone bit at 930 feet due to excessive water production.

Installation of well NSH-017 commenced on 5 December 2014 after geophysical logging was completed in the borehole. The well construction materials consisted of 6-inch nominal diameter LCS; blank casing was installed to 940 feet and the screened interval extended from 940 to 1,181 feet. Filter pack was installed to 930 feet, transition sand was installed to 919 feet, and high-solids bentonite grout was installed to 382 feet. Above the high-solids bentonite grout, 22 feet of bentonite chips were installed, and Tacna gravel and %-inch pea gravel were installed to land surface.

# 2.12.2 Geophysical Logging

Geophysical logging was conducted in the borehole of well NSH-017 by IDS-Colog and commenced on 3 December 2014. The geophysical survey was completed 4 December 2014 and included the following logs:

- Caliper/Gamma/Temperature/Conductivity,
- Electrical Resistivity,
- Sonic,
- Acoustic Borehole Televiewer,
- Optical Borehole Televiewer,
- CDFM: Ambient, and
- CDFM: Injection (average rates per survey were between approximately 74 to 78 gpm).



The geologic logs collected were used in the interpretation of the lithology and were utilized by Excelsior to expand their geologic model. Interpretation of flow logging will be summarized in the aquifer testing report. Copies of the geophysical logs are included in Appendix D.

# 2.12.3 Lithology

The borehole penetrated the bottom of the alluvium at approximately 420 feet. Penetration rates in the alluvium were generally between approximately 0.6 and 1.8 minutes per foot. The alluvium consists of clayey sand with gravel from land surface to approximately 20 feet bls overlying sand with gravel to approximately 420 feet. The upper portion of alluvium (from approximately 20 to 250 feet) is comprised of approximately 50 to 60 percent granitic clasts and approximately 40 to 50 percent non-granitic clasts. The lithology of the granitic clasts is consistent with the Texas Canyon quartz monzonite and the non-granitic clasts are primarily sedimentary and metamorphic rocks. The lower portion of the alluvial unit (below approximately 250 feet) is comprised of approximately 95 percent granitic clasts and approximately 5 percent non-granitic clasts.

The Texas Canyon quartz monzonite was encountered underlying the alluvium at approximately 420 feet. From the alluvium contact to 1,030 feet, the formations alternate between the Middle Abrigo Formation and dikes of the Texas Canyon quartz monzonite. The Texas Canyon quartz monzonite is present between 460 feet and 550 feet, 630 feet and 720 feet, 740 feet and 760 feet, and sporadically between 780 feet and 830 feet. The Middle Abrigo Formation is present between 550 feet and 630 feet, 720 feet and 740 feet, 760 feet and 780 feet, sporadically between 780 feet and 830 feet, and 830 feet and 1030 feet. Penetration rates in the Texas Canyon quartz monzonite were generally between approximately 2.1 and 5.4 minutes per foot, and within the Middle Abrigo Formation between 1.4 and 29.4 minutes per foot. From 1,030 to 1,200 feet was the Lower Abrigo Formation, which had penetration rates between approximately 1.3 and 13.2 minutes per foot.

Well NSH-017 appears to have intersected the Black Rock fault at a depth of 515 feet based on interpretation of Optical Borehole Image (OBI) data. The borehole encountered significant water production at a depth of 790 feet. The borehole was terminated at a depth of 1,200 feet based on mineralogical observations made by Excelsior. An unanticipated structure that is sub-parallel to the bedding plane dip was encountered at a depth of 1,000 feet based on interpretation of Acoustic Borehole Imaging (ABI) data. A detailed lithology log is included in Appendix A.

The occurrence of groundwater during drilling was first noted in the 760- to 780-foot interval; no makeup water was being used and approximately 50 gpm of water discharged with the drilled cuttings. The penetration rate in this interval was approximately 3.9 minutes per foot. At 920 feet, groundwater production increased to an estimated 250 gpm and continued to increase to approximately 300 gpm.

#### 2.12.4 Well Development

Development of Well NSH-017 was conducted 7 January 2015 using the Grundfos 40S 100-30 pump. The development consisted of pumping the well using approximately 30-minute pumping intervals with a 20-minute surge period between pumping. On 7 January 2015, with the pump set at approximately 926 feet, the pumping rates were increased from 5 gpm to the maximum pumping capacity of 30 gpm. The pump was raised to approximately 713 feet, and was pumped and surged repeatedly for a duration of 25 minutes at maximum capacity of 32 gpm with a 45 minute recovery. Pumping continued for approximately three hours at rates between approximately 10 and 32 gpm.



On 27 January 2015, NSH-017 was developed again using the Grundfos 85S 200-30. With the pump installed to approximately 931 feet, the well was pumped at approximately 80 gpm for 3.75 hours; maximum drawdown during development was approximately 64 feet. At the beginning of the development period, the water included 0.1 ml/L of sand with turbid water (182 nephelometric turbidity units [NTU]). At the end of the development period, the discharge was clear and free of sand. Field forms documenting well development are included in Appendix C.

#### 2.13 WELL NSH-018

Well NSH-018 was sited at location NSH-CV to characterize the lower oxide bedrock zone to the east of the planned in-situ recovery area. Well NSH-018 was not planned to intersect any significant structures.

NSH-018 is a 4-inch cased-hole design with a planned depth of 1,565 feet and was drilled by NEWP using the 685 drilling rig and the air-rotary method.

# 2.13.1 Borehole Drilling and Well Installation

Drilling activities for well NSH-018 commenced on 23 November 2014. A 20-inch diameter borehole was drilled to 20 feet, LCS surface casing with a 12-inch nominal diameter was installed to 20 feet, and neat cement grout was installed from 20 feet to land surface.

Borehole drilling continued on 24 November 2014 using a 10-inch diameter air-rotary hammer bit and was drilled to 960 feet before the bit was changed to 9%-inch tri-cone due to water production. The borehole was drilled to a total depth of 997 feet.

Installation of well NSH-018 commenced on 7 December 2014 after geophysical logging was completed. The well included 4-inch nominal diameter LCS; blank casing was installed to 610 feet and the screened interval extended from 610 to 992 feet. The filter pack was installed from total depth of the borehole to 599 feet, transition sand was installed to 589 feet, bentonite chips were installed to 564 feet, and formation stabilizer consisting of %-inch pea gravel and Tacna gravel was installed to land surface.

# 2.13.2 Geophysical Logging

Geophysical logging was completed in the borehole of well NSH-018 by IDS-Colog and commenced on 6 December 2014. The geophysical survey was completed 6 December 2014 and included the following logs:

- Caliper/Gamma/Temperature/Conductivity,
- Electrical Resistivity,
- Sonic, and
- Acoustic Borehole Televiewer (two files: initial analysis and after additional processing).

Flow logging was conducted by IDS-Colog on 7 December 2014. The ambient flow meter testing was performed with a CDFM tool. Injection was started at approximately 50 gpm, but had to be increased to 70 gpm for dynamic flow testing with CDFM tool.

- CDFM: Ambient, and
- CDFM: Injection (average was approximately 68 gpm).



The geologic logs collected were used in the interpretation of the lithology and were utilized by Excelsior to expand their geologic model. Interpretation of flow logging will be summarized in the aquifer testing report. Copies of the geophysical logs are included in Appendix D.

# 2.13.3 Lithology

The borehole penetrated the bottom of the alluvium at approximately 420 feet. Penetration rates in the alluvium were generally between approximately 0.5 and 1.0 minute per foot. The alluvium consists of silty sand with gravel from land surface to approximately 10 feet, overlying silty sand from 10 feet to 20 feet. Lean clay with sand from 20 feet to 30 feet, silty sand from 30 feet to 40 feet, and gravel with sand from 40 feet to 420 feet.

The Black Prince Formation was encountered underlying the alluvium at approximately 420 feet and continued to the total depth of borehole at 997 feet. The Black Prince Formation drilled at penetration rates ranging between approximately 2.1 and 5.4 minutes per foot until groundwater production increased to the point that it affected the drilling rate. The final penetration rate of the air-rotary hammer, from 910 feet to 960 feet, decreased to 30 minutes per foot. The occurrence of groundwater during drilling was first noted when drilling the 580- to 600-foot interval. At 910 feet, the driller reported hitting a fracture and groundwater production increased to an estimated 200 gpm, and varied between an estimated 200 gpm and 400 gpm depending on how much air pressure the driller was applying. The rate of groundwater production provided too much pressure for the hammer to work properly; the bit was changed to a 9%-inch tri-cone bit at 960 feet and was used to complete the borehole at 997 feet.

Well NSH-018 intersected apparent voids which produced a significant flow of water into the borehole. The borehole was terminated at a depth of 992 feet as a result of excessive water production and was re-classified as an upper oxide test well based on the revised depth. Well NSH-018 was completed at a depth of 992 feet, and is screened from 610 to 992 feet.

## 2.13.4 Well Development

Development of Well NSH-018 was conducted 20 to 21 December 2014. On 20 December 2014, the well was pumped at an estimated 38 gpm for 40 minutes, with the pump set at approximately 656 feet. On 21 December 2015, pump development resumed and consisted of 11 pump and surge cycles ranging in duration from 20 minutes to 5 minutes of pumping, with periods of recovery (generally 5 to 10 minutes), as dictated by well performance.

On 9 January 2015, NSH-018 was developed again using the Grundfos 40S 100-30. With the pump installed to approximately 700 feet, the well was pumped at approximately 20 gpm for 1 hour; the discharge contained less than 0.1 ml/L of sand and appeared slightly cloudy. The pumping rate was increased to 30 gpm for 2 hours, after which the rate was increased to the maximum pump capacity (approximately 35 gpm) for 1 hour. Maximum drawdown was approximately 6 feet and the sand content was less than 0.1 ml/L sand and clear at the end of the development period. Field forms documenting well development are included in Appendix C.



#### 2.14 WELL NSH-019

Well NSH-019 was sited at location NSH-DA, which is one of two planned well locations intended to characterize the interior of the structural block located between the Sonora and Mojave #1 faults. Well NSH-021 is to be the second well in this pair. Well NSH-019 was planned to be completed in the oxide bedrock zone.

NSH-019 was designed and constructed as an open borehole well with a planned depth of 1,440 feet, and was drilled by NEWP using the 50k drilling rig and the air rotary method.

# 2.14.1 Drilling and Casing Installation

Drilling activities for well NSH-019 commenced on 7 December 2014. A 20-inch diameter borehole was drilled to 20 feet, LCS surface casing with a 14-inch nominal diameter was installed to 20 feet, and neat cement grout was installed to land surface.

Borehole drilling continued on 7 December 2014 using a 13-inch diameter air-rotary hammer bit to a depth of 638 feet. Installation of 8-inch nominal diameter intermediate casing commenced on 9 December 2014 and was installed to a depth of approximately 638 feet. Bentonite chips were installed from approximately 631 to 638 feet, neat cement grout was installed from 588 feet to 631 feet high-solids bentonite grout was installed from 588 feet to land surface. The casing installation was completed on 10 December 2014.

Bedrock drilling commenced on 10 December 2014. The borehole was drilled with a 7%-inch hammer bit to a depth of approximately 1,188 feet on 11 December 2014. Groundwater production rates were too high for the hammer bit to function properly and consequently the borehole was completed using a 7%-inch tri-cone bit on to a depth of 1,410 feet on 14 December 2014.

On 21 December 2014, the level of the cement in the annulus was observed to have dropped to approximately 65 feet. The annulus was filled with %-inch bentonite chips to approximately 51 feet and Tacna gravel was installed to land surface.

Well construction field forms are included in Appendix B, an as-built well diagram for NSH-019 is included as Figure 14, and well construction details are summarized in Table I.

## 2.14.2 Geophysical Logging

A geophysical logging survey of the open bedrock interval of well NSH-019 was conducted by IDS-Colog from 14 to 15 December 2014. The geophysical survey included the following logs:

- Caliper/Gamma/Temperature/Conductivity,
- Sonic,
- Acoustic Borehole Televiewer,
- Electrical Resistivity,
- Gamma-Gamma Density, and
- Neutron.



Flow logging was conducted by IDS-Colog on 17 December 2014. The ambient flow testing was performed with a CDFM tool and dynamic flow testing was performed with a spinner flow meter tool. Injection was started at approximately 80 gpm for dynamic flow testing with spinner tool. Six runs were completed at approximately 80 gpm injection rate. The flow logging survey included the following logs:

CDFM: Ambient, and

Spinner: Injection (80 gpm).

The geologic logs collected were used in the interpretation of the lithology and were utilized by Excelsior to expand their geologic model. Interpretation of flow logging will be summarized in the aquifer testing report. Copies of the geophysical logs are included in Appendix D.

# 2.14.3 Lithology

The bottom of the alluvium was encountered at approximately 550 feet. Penetration rates in the alluvium were generally between approximately 0.4 and 1.2 minutes per foot. From land surface to approximately 40 feet, the alluvium consisted of silty sand with gravel. From 40 feet to 550 feet, the alluvium consisted of sand with gravel. During drilling of the borehole for the intermediate casing, no evidence of saturation in the alluvium was observed.

The Martin Formation was the first bedrock encountered at approximately 550 feet and continued to 710 feet. Penetration rates in the bedrock ranged from 0.8 minutes per foot to 9.3 minutes per foot when drilling with the hammer bit. When drilling changed to the tri-cone bit, penetration rates steadily decreased from 13.5 minutes per foot to 42.8 minutes per foot.

The geology encountered consisted of one repeating interval. The Martin Formation was penetrated from 550 feet to 710 feet, overlying an interval of the Upper Abrigo Formation to approximately 810 feet. The Martin Formation was observed again from approximately 810 to 850 feet overlying a sequence of the Abrigo Formations; Upper Abrigo Formation from 850 feet to 1,020 feet, Middle Abrigo Formation from 1,020 feet to 1,240 feet, and the Lower Abrigo Formation from 1,240 feet to 1,410 feet. Drilling was terminated at a depth of 1,410 feet based on mineralogical observations made by Excelsior. The open borehole interval of the well partially caved in prior to aquifer testing; the fill was measured at 1,300 feet.

## 2.14.4 Well Development

NSH-019 was developed by airlift on 9 February 2015. The initial airlift development was conducted from approximately 900 feet for 35 minutes and discharge was approximately 55 gpm. At the end of the 35 minutes of development, sand content was less than 0.1 ml/L and the groundwater was clear. The well recharged for 30 minutes, after which airlift development was continued from a depth of 1,000 feet. Airlift development continued for 75 minutes at approximately 60 gpm; the final samples from development were clear and free of sand. Field forms documenting well development are included in Appendix C.



#### 2.15 WELL NSH-020

Well NSH-020 was sited at location NSH-CX to characterize the upper oxide bedrock zone to the east of the planned in-situ recovery area. Few previous holes have been drilled in this area and geologic structure in this area is poorly constrained within the geologic model. Well NSH-020 was not planned to intersect any significant structures. Following completion of well NSH-018 as an upper oxide test well, Well NSH-020 was re-classified as a lower oxide test well.

NSH-020 is a 4-inch cased well with a planned depth of 1,075 feet; the well was drilled by NEWP using the 685 drilling rig and the air rotary method.

## 2.15.1 Drilling and Well Installation

Drilling activities for well NSH-020 commenced on 8 December 2014. A 20-inch diameter borehole was drilled to 20 feet, LCS surface casing with a 12-inch nominal diameter was installed to 20 feet, and neat cement grout was installed from 20 feet to land surface.

Borehole drilling continued on 9 December 2014 using a 10-inch diameter air-rotary hammer bit to a depth of 1,600 feet. Installation of well NSH-020 commenced on 17 December 2014 after geophysical logging was completed. The well was constructed using 4-inch nominal diameter LCS; blank casing was installed to 1,060 feet with three separate screened intervals below. The screened intervals were installed from 1,060 feet to 1,181 feet, 1,241 feet to 1,402 feet, and 1,472 feet to 1,582 feet with blank casing sections between the three screened intervals. The filter pack was installed from the top of the fill to 1,459 for the lower screen interval feet, from 1,406 feet to 1,227 feet for the middle screened interval, and from 1,202 feet to 1,050 feet for the upper screened interval. The three filter pack intervals were separated by bentonite seals. Transition sand was installed from 1,035 to 1,050 feet, and high-solids bentonite grout was installed to land surface.

On 21 December 2014, the level of grout in the annulus was observed to have dropped to approximately 340 feet. The annulus was filled with bentonite chips to 320 feet and Tacna gravel was installed to surface.

Well construction field forms are included in Appendix B, an as-built well diagram for NSH-020 is included as Figure 15, and well construction details are summarized in Table I.

## 2.15.2 Geophysical Logging

A geophysical survey of the borehole at NSH-020 was conducted by IDS-Colog and commenced on 15 December 2014. The geophysical survey was completed 16 December 2014 and included the following logs:

- Caliper/Gamma/Temperature/Conductivity,
- Electrical Resistivity,
- Sonic, and
- Acoustic Borehole Televiewer.



Flow logging was conducted by IDS-Colog on 16 December 2014. The ambient flow meter testing was performed with a CDFM tool. Injection was started at approximately 75 gpm but had to be increased to 150 gpm for dynamic flow testing with the CDFM tool. The flow logging survey included the following logs:

- CDFM: Ambient, and
- CDFM: Injection (average rate for each survey were between approximately 133 and 147 gpm).

The geologic logs collected were used in the interpretation of the lithology and were utilized by Excelsior to expand their geologic model. Interpretation of flow logging will be summarized in the aquifer testing report. Copies of the geophysical logs are included in Appendix D.

# 2.15.3 Lithology

The bottom of the alluvium was encountered at approximately 450 feet. Penetration rates in the alluvium were generally between approximately 0.4 and 1.2 minutes per foot. The alluvium consists of sand with gravels, with the upper portion from land surface to 300 feet being comprised of mixed lithics containing approximately 50 percent granitic clasts from the Texas Canyon quartz monzonite and 50 percent non-granitic clasts sedimentary and metamorphic rocks. From 300 feet to 450 feet, the alluvium consists of primarily granitic alluvium, approximately 80 percent granitic clasts and 20 percent non-granitic clasts.

The Black Prince Formation was the first bedrock encountered at approximately 450 feet and continued to 1,170 feet. The penetration rates in the Black Prince Formation ranged between approximately 1.1 and 3.8 minutes per foot. The occurrence of groundwater during drilling was first noted at the 700 to 720 foot interval. At approximately 1,120 feet, groundwater production increased to an estimated 400 gpm (visual estimation) and varied between an estimated 200 gpm and 400 gpm depending on how much air pressure the driller applied. The rate of groundwater production provided too much pressure for the air-rotary hammer to work properly, and a 9%-inch tri-cone bit was used to complete the borehole from 1,130 feet. Underlying the Black Prince Formation, the Escabrosa Formation was encountered from 1,170 feet to 1,550 feet; the penetration rate ranged from 1.8 to 6.2 minutes per foot. The Martin Formation was penetrated from 1,550 feet, and to the total depth of the well at 1,600 feet; penetration rates ranged from 2.8 to 6.7 minutes per foot.

Well NSH-020 intersected apparent voids which produced a significant flow of water into the borehole. The hole was advanced to a depth of 1,600 feet based on the re-classification of this well; the three screened intervals in well NSH-020 are located between 1,050 and 1,582 feet, which are positioned opposite of three zones containing voids and structural features that were observed to contribute significant groundwater flow to the well. A detailed lithologic log is included in Appendix A.

## 2.15.4 Well Development

Pump development of Well NSH-020 was conducted on 8 January 2015. A Grundfos 40S 100-30 was installed to a depth of 700 feet. Initially, the well was purged at approximately 5 gpm; however the pump began having issues and was pumping intermittently; it was shut down completely to allow for recovery. When the pump was restarted at maximum capacity (approximately 35 gpm), no further issues were observed. Pumping at approximately 35 gpm continued for approximately 1.5 hours, followed by a 25-minute recovery period. Pumping continued for 1 hour at 32 gpm. The maximum drawdown was approximately 27 feet and the discharge at the end of the development period was free of sand and clear. Field forms documenting well development are included in Appendix C.



#### 2.16 WELLS NSH-021 & NSH-021B

Well NSH-021 was sited at location NSH-DB as the second well of a two-well pair intended to characterize the interior of the structural block located between the Sonora and Mojave #1 faults. Well NSH-019 is the first well in this pair. Well NSH-021 was planned to be completed at a depth of 1,392 feet, in the oxide bedrock zone.

Incorrect surface casing was installed at Well NSH-021. No drilling occurred after the surface casing was set at this location. The surface casing at Well NSH-021 was capped and the rig moved over to Well NSH-021B. No further drilling is planned at Well NSH-021.

A drill bit was lost in bore hole NSH-021B at a depth of 1,250 feet. Fishing was stopped and NSH-021B was abandoned using cement-bentonite grout from total depth to surface on 9 January 2015. Lithologic observations made drilling of NSH-021B are reported under the heading NSH-021C.

## 2.17 WELL NSH-021C

Well NSH-021C was sited adjacent to the NSH-DB hole as a replacement location for NSH-021B. NSH-021C was designed and completed as an open borehole well with a planned depth of 1,392 feet. The well was drilled by NEWP using a 50k drilling rig and the air rotary method.

## 2.17.1 Drilling and Casing Installation

Drilling activities for well NSH-021C commenced on 10 January 2015. A 20-inch borehole was drilled to 20 feet, LCS surface casing with a 14-inch nominal diameter was installed to 20 feet, and neat cement grout was installed to land surface.

Borehole drilling continued on 10 January 2015 using a 13-inch diameter air-rotary hammer bit to a depth of 624 feet. The intermediate casing, consisting of 8-inch nominal diameter LCS casing, was installed on 11 January 2015 to approximately 624 feet. Neat cement grout was installed from approximately 562 to 624 feet, and high-solids bentonite grout was installed to land surface on 12 January 2015.

Drilling of bedrock commenced with a 7%-inch diameter hammer bit. On 13 January 2015, large volumes of water in the borehole flooded the hammer bit. A 7%-inch tri-cone bit was used to drill the remainder of the borehole from approximately 1,160 feet, reaching a total depth of 1,400 feet on 14 January 2015.

On 8 February 2015, the level of the grout in the annulus was observed to have dropped to approximately 313 feet. A 5-foot thick interval of %-inch bentonite chips was installed and Tacna gravel was installed to surface.

Well construction field forms are included in Appendix B, an as-built well diagram for NSH-021C is included as Figure 16, and well construction details are summarized in Table I.

## 2.17.2 Geophysical Logging

A geophysical logging survey open borehole interval of well NSH-021C was conducted by IDS-Colog on 20 February 2015. The geophysical survey included the following logs:

Caliper/Gamma/Temperature/Conductivity,



- Sonic,
- Acoustic Borehole Televiewer, and
- Electrical Resistivity.

Flow testing was conducted at NSH-021C on 20 February 2015. Ambient flow testing was performed with a CDFM tool and dynamic flow testing was performed with a spinner flow meter tool. Injection was started at approximately 80 gpm for dynamic flow testing with the spinner tool. Injection continued for approximately 6 hours, with an injection rate varying from approximately 70 to 80 gpm. During the injection, eight spinner logs were run at approximately 40 feet per minute. The well was then allowed to recover for approximately 1 hour. The flow logging survey included the following logs:

- CDFM: Ambient, and
- Spinner: Injection (line speed was approximately 40 feet/min; average injection rate was 70.5 gpm).

The geologic logs collected were used in the interpretation of the lithology and were utilized by Excelsior to expand their geologic model. Interpretation of flow logging will be summarized in the aquifer testing report. Copies of the geophysical logs are included in Appendix D.

## 2.17.3 Lithology

The bottom of the alluvium was encountered at approximately 540 feet. Penetration rates in the alluvium were generally between approximately 0.3 and 1.0 minute per foot. The upper portion of alluvium (to approximately 290 feet) is comprised of approximately 50 percent granitic clasts and approximately 50 percent non-granitic clasts. The lithology of the granitic clasts is consistent with the Texas Canyon quartz monzonite, and the non-granitic clasts are primarily carbonate rocks. The lower portion of the alluvial unit is comprised of approximately 90 percent granitic clasts and approximately 10 percent non-granitic clasts. During drilling of the borehole for intermediate casing, there was no evidence of saturation in the alluvium.

The Martin Formation was the first bedrock encountered at approximately 540 feet, continuing to 620 feet and contained chrysocolla from approximately 590 to 620 feet. The interval from approximately 620 to 640 feet is a transition zone between the Martin and Upper Abrigo formations. The Upper Abrigo Formation was penetrated completely from approximately 640 to 1,020 feet, and contained chrysocolla between 640 to 670 feet and between 750 to 830 feet. The Middle Abrigo Formation was penetrated completely from approximately 1,020 to 1,250 feet and contained copper mineralization from 1,070 to 1,080 feet and 1,140 to 1,150 feet. The Lower Abrigo was encountered from approximately 1,250 feet to the total depth of 1,400 feet, and contained a lens of iron oxide between 1,370 to 1,380 feet. Penetration rates in the Martin and Abrigo formations varied from approximately 0.8 to 6.8 minutes per foot.

Moderate fracturing was noted throughout the well. ABI interpretation shows significant fracture zone from 750 to 775 feet (geologic model estimates placed the zone approximately 50 to 100 feet higher); orientation of fracturing correlates to a reverse fault indicated in the geologic model. A detailed lithologic log is included in Appendix A.



## 2.17.4 Well Development

Airlift development was conducted by BJ Drilling. On 30 January 2015, BJ Drilling installed an airline to approximately 800 feet and started airlifting at approximately 25 gpm. The well was airlifted and allowed to recover repeatedly at approximate rates of 25, 35, and 75 gpm. Initially the discharge was cloudy to turbid and brown, with variable sand content of approximately 0.4 ml/L. By the end of the airlift development, the discharge was clear and the sand content had decreased. Field forms documenting well development are included in Appendix C.

#### 2.18 WELL NSH-022

Well NSH-022 was sited for the purpose of characterizing the interior of the structural block located between the Forty Mile, Great Sandy, and Atacama faults. Well NSH-022 is planned for completion as a lower oxide test well. No major structures were planned to be intersected by well NSH-022. The planned depth of well NSH-022 was 1,408 feet; the well was drilled by NEWP using the 685 drilling rig, and the air rotary method.

## 2.18.1 Drilling and Well Installation

Drilling activities for well NSH-022 commenced on 20 December 2014. A 20-inch borehole was drilled to 20 feet, LCS surface casing with a 14-inch outside diameter (0.25-inch wall thickness) was installed to 20 feet, and neat cement grout was installed from 20 feet to land surface.

Borehole drilling continued on 21 December 2014 using a 12-inch diameter air-rotary hammer bit. Rough drilling conditions destroyed the hammer bit which was not advanced deeper than 660 feet. Drilling continued with 11%-inch and 11%-inch tri-cone bits to a depth of 1,170 feet. The borehole was drilled by the air rotary method to approximately 1,020 feet; however, the mud rotary method was used to complete borehole drilling due to formation instability. Installation of well NSH-022 commenced on 16 January 2015 after geophysical logging was completed. The well included 6-inch nominal diameter LCS; blank casing was installed to approximately 1,010 feet and the screened interval extended from 1,010 to 1,131 feet. Filter pack was installed from the bottom of the borehole to approximately 997 feet, transition sand was installed to approximately 972 feet, and high-solids bentonite grout was installed to land surface on 19 January 2015.

On 2 February 2015, the level of the cement in the annulus was observed to have dropped to approximately 209 feet. A 5-foot thick interval of %-inch bentonite chips was installed in the annulus and Tacna gravel was installed to surface.

Well construction field forms are included in Appendix B, an as-built well diagram for NSH-022 is included as Figure 17, and well construction details are summarized in Table I.

## 2.18.2 Geophysical Logging

A geophysical logging survey of the borehole for well NSH-022 was conducted by IDS-Colog and commenced on 15 January 2015 and included the following logs:

- Caliper/Gamma/Temperature/Conductivity,
- Electrical Resistivity,



- Sonic, and
- Acoustic Borehole Televiewer.

The geologic logs collected were used in the interpretation of the lithology and were utilized by Excelsior to expand their geologic model. Copies of the geophysical logs are included in Appendix D.

## 2.18.3 Lithology

The bottom of the alluvium was encountered at approximately 600 feet. Penetration rates in the alluvium were generally between approximately 0.5 and 1.9 minutes per foot. The alluvium consists of approximately 50 percent granitic clasts and approximately 50 percent non-granitic clasts to approximately 320 feet. The lithology of the granitic clasts is consistent with the Texas Canyon quartz monzonite, and the non-granitic clasts are primarily sedimentary and metamorphic rocks. The lower portion of the alluvial unit (from approximately 320 to 600 feet) is comprised of approximately 90 percent granitic clasts and approximately 10 percent non-granitic clasts.

The Escabrosa Formation was the first bedrock encountered at approximately 600 feet, continuing to 720 feet, and included coarse grained marble. Penetration rates in the Escabrosa Formation were generally between approximately 2 and 18 minutes per foot; no evidence of groundwater was observed during drilling. An 11%-inch tri-cone bit was used from approximately 660 feet to total depth due to borehole stability issues.

The top of the Martin Formation was encountered at approximately 720 feet and included altered carbonates and highly mineralized zones from approximately 730 to 770 feet and from approximately 930 to 960 feet. Penetration rates in the Martin Formation were between approximately 2 and 32 minutes per foot and an additional tri-cone bit was required (11%-inch diameter). The Abrigo Formation was penetrated at approximately 1,000 feet and penetration rates in the formation were between approximately 4 and 48 minutes per foot to the total depth of the borehole, at approximately 1,170 feet. A detailed lithologic log is included in Appendix A.

ABI interpretations reveal moderate fracturing from 600 to 1,000 feet, representing a north-northwest striking and southwest dipping fault (which is in opposite of the typical trend). Intense fracturing was observed from 1,000 to 1,030 feet, which roughly mirrors bedding planes and correlates well with the geologic model.

## 2.18.4 Well Development

Development of well NSH-022 included airlift and pump activities conducted by NEWP. After installation of the well, tremie pipe was installed as an airline to airlift develop the well with the drilling rig. The well was developed by airlift for a total of approximately 6 hours on 20 and 21 January 2015; the airline was initially installed to approximately 600 feet and was worked down to approximately 1,000 feet by the end of the development period. The discharge rate was approximately 1 to 2 gpm and was turbid with trace sand. The sand content, turbidity, and discharge rate did not appear to change during the development period.

Further development was conducted by NEWP using a pump rig. From 22 to 25 January 2015, the well was developed by swab and bail and pump activities. A tightly fitting swab tool was reciprocated through the screened interval for approximately four total hours on 23 and 24 January 2015 to work in



dispersant (Baroid AquaClear PFD). During pumping, the discharge rate would decrease to approximately 1 gpm at a pumping water level at approximately 865 feet. By the end of the development period, the turbidity of the discharge decreased significantly and appeared cloudy to clear. Field forms documenting well development are included in Appendix C.

#### 2.19 WELL NSH-023

Well NSH-023 was sited at location NSH-DD as the second well of a two-well pair intended to characterize the interior of the structural block located between the Forty Mile and Mojave #1 faults. Well NSH-024 is the other well in this pair. Push-pull pumping and extraction tests were to be conducted using these two wells. Completion was planned in the oxide bedrock zone. The well design was an open borehole with a planned depth of 1,446 feet. NSH-023 was drilled by NEWP using a 50k drilling rig and the air rotary method with stiff foam.

## 2.19.1 Drilling and Casing Installation

Drilling activities for well NSH-023 commenced on 14 January 2015. A 20-inch diameter borehole was drilled to 20 feet, LCS surface casing with a 14-inch outside diameter (0.25-inch wall thickness) was installed to 20 feet, and cement-bentonite grout was installed to land surface.

Borehole drilling continued on 14 January 2015 using a 13-inch diameter air-rotary hammer bit to a depth of 645 feet. Installation of an intermediate casing commenced on 15 January 2015; the casing included 8-inch nominal diameter LCS casing to approximately 645 feet. High-solids bentonite grout was installed from approximately 645 feet to land surface. The casing installation was completed on 16 January 2015.

Drilling of the bedrock with a 7%-inch hammer bit commenced on 16 January 2015; the borehole was drilled to a total depth of approximately 1,446 feet on 18 January 2015.

On 8 February 2015, the level of grout in the annulus was observed to have dropped to approximately 154 feet. A 5-foot thick interval of %-inch bentonite chips was installed in the annulus then Tacna gravel was installed to surface.

Well construction field forms are included in Appendix B, an as-built well diagram for NHS-023 is included as Figure 18, and well construction details are summarized in Table I.

## 2.19.2 Geophysical Logging

A geophysical survey of the open borehole completion interval of well NSH-023 was conducted by IDS-Colog on 18 February 2015. The geophysical survey included the following logs:

- Caliper/Gamma/Temperature/Conductivity,
- Sonic,
- Electrical Resistivity,
- Acoustic Borehole Televiewer,
- Neutron, and
- · Gamma-Gamma Density.



Flow testing was conducted at NSH-023 from 18 to 19 February 2015. Ambient flow testing was performed with a CDFM tool. Injection was started at approximately 5 gpm. Injection continued for approximately 6 hours, with an injection rate varying from approximately 5.8 to 8.8 gpm. During the injection, the CDFM tool was run at intervals of interest. The well was then allowed to recover for approximately 1 hour. The flow logging survey included the following logs:

CDFM: Ambient, and

CDFM: Injection (average rate was 5.54 gpm).

On 26 May 2015, Southwest Exploration (Southwest) set up the necessary equipment at NSH-023 for flow testing during the twin test with NSH-024. While attempting to confirm the total depth of the hole, Southwest encountered an obstruction at approximately 906 feet and was unable to reach total depth. Planned testing and further logging were canceled due to lack of available depth to gather data.

The geologic logs collected were used in the interpretation of the lithology and were utilized by Excelsior to expand their geologic model. Interpretation of flow logging will be summarized in the aquifer testing report. Copies of the geophysical logs are included in Appendix D.

## 2.19.3 Lithology

The bottom of the alluvium was encountered at approximately 620 feet. Penetration rates in the alluvium were generally between approximately 0.4 and 0.8 minute per foot. The upper portion of alluvium, to approximately 420 feet, is comprised of approximately 50 percent granitic clasts and approximately 50 percent non-granitic clasts. The lithology of the granitic clasts is consistent with the Texas Canyon quartz monzonite, and the non-granitic clasts are primarily carbonate rocks. The lower portion of the alluvial unit is comprised of approximately 90 percent granitic clasts and approximately 10 percent non-granitic clasts. During drilling of the borehole for intermediate casing, there was no evidence of saturation in the alluvium.

The Martin Formation was the first bedrock encountered at a depth of approximately 620 feet, and extended to 850 feet. The Martin Formation was observed to contain copper oxides from approximately 590 to 620 feet, 720 to 740 feet, at 780 feet, and 820 to 840 feet. The upper 300 feet of bedrock is observed to be highly fractured. The Upper Abrigo Formation was fully penetrated from approximately 850 to 1,190 feet and contained abundant iron oxides and minor copper oxides. Based on geophysical investigations, structural features and/or fractured areas were encountered from approximately 650 to 750 feet and 895 to 915 feet. The observed features correlate well with geological model features parallel to bedding and a reverse fault, respectively. The Middle Abrigo Formation was penetrated completely from approximately 1,190 to 1,260 feet and contained copper sulfides. The Lower Abrigo was encountered from approximately 1,260 feet to the total borehole depth of 1,446 feet and contained copper sulfides. Penetration rates in the Martin and Abrigo formations varied from approximately 0.7 to 3.8 minutes per foot. A detailed lithologic log is included in Appendix A.

## 2.19.4 Well Development

Several rounds of development were conducted on NSH-023 by both BJ Drilling and NEWP, due to scheduling demands and rig availability. Pump development was conducted by NEWP on 20 January 2015; NEWP installed a submersible pump (Grundfos, model 40S 100-30) to approximately 900 feet. The well was initially purged at a rate of approximately 18 gpm for approximately 1.5 hours, resulting in a drawdown of approximately 109 feet. Following the initial purge, the well was repeatedly purged and allowed to recover. The discharge initially contained foam and abundant sand. By the end of the pump development, the discharge had cleared of foam and the sand content had decreased.



Airlift development was conducted by BJ Drilling on 3 February 2015. BJ Drilling installed an airline to approximately 800 feet and started airlifting at approximately 10 gpm. The well was pumped and allowed to recover repeatedly at various settings. The airline was moved to approximately 900 feet and airlifted at approximately 25 gpm, then moved to approximately 1,000 feet and airlifted at approximately 30 gpm. Throughout development, discharge was cloudy to turbid and brown, with variable sand content ranging from approximately 0.1 to 0.9 ml/L. Field forms documenting well development are included in Appendix C.

#### 2.20 WELL NSH-024

Well NSH-024 was sited at location NSH-DC as the second well of a two-well pair intended to characterize the interior of the structural block located between the Forty Mile and Mojave #1 faults. Completion was planned in the oxide bedrock zone.

NSH-024 was designed and constructed as an open borehole completion with a planned depth of 1,445 feet; it was drilled by NEWP using the 50k drilling rig and the air rotary method.

## 2.20.1 Drilling and Casing Installation

Drilling activities for well NSH-024 commenced on 18 January 2015. A 20-inch diameter borehole was drilled to 20 feet and LCS surface casing with a 14-inch nominal diameter was installed to 20 feet and grouted to the surface using neat cement grout.

Borehole drilling continued on 19 January 2015 using a 13-inch diameter air-rotary hammer bit to a depth of approximately 625 feet. Installation of intermediate casing for well NSH-024 commenced on 19 January 2015. The casing consisted of 8-inch nominal diameter LCS and was installed to 625 feet. Bentonite chips were installed to 612 feet and high-solids bentonite grout was installed to land surface pipe. The casing installation was completed on 20 January 2015.

Drilling of the bedrock with a 7%-inch hammer bit commenced on 20 January 2015; the borehole was drilled to a total depth of approximately 1,445 feet on 22 January 2015.

On 8 February 2015, the level of the cement in the annulus was observed to have dropped to approximately 109 feet. A 5-foot thick interval of %-inch bentonite chips was installed and Tacna gravel was installed to surface.

Well construction field forms are included in Appendix B, an as-built well diagram for NHS-024 is included as Figure 19, and well construction details are summarized in Table I.

## 2.20.2 Geophysical Logging

A geophysical logging survey of the open bedrock interval of well NSH-024 was conducted by IDS-Colog on 23 January 2015, with oversight from Excelsior. The geophysical survey included the following logs:

- Caliper/Gamma/Temperature/Conductivity,
- Electrical Resistivity,
- Sonic, and
- Acoustic Borehole Televiewer.



Flow testing was conducted at NSH-024 from 19 to 20 February 2015. Ambient flow testing was performed with a CDFM tool. Injection was started at approximately 9 gpm. Injection continued for approximately 3.5 hours, with an injection rate varying from approximately 5.83 to 8.84 gpm. During the injection, the CDFM tool was run at intervals of interest. The flow logging survey included the following logs:

CDFM: Ambient, and

CDFM: Injection (average rate was 8.76 gpm).

The geologic logs collected were used in the interpretation of the lithology and were utilized by Excelsior to expand their geologic model. Interpretation of flow logging will be summarized in the aquifer testing report. Copies of the geophysical logs are included in Appendix D.

## 2.20.3 Lithology

The bottom of the alluvium was encountered at approximately 600 feet. Penetration rates in the alluvium were generally between approximately 0.35 and 0.65 minute per foot. The upper portion of alluvium (to approximately 380 feet) is comprised of approximately 50 percent granitic clasts and approximately 50 percent non-granitic clasts. The lithology of the granitic rocks is consistent with the Texas Canyon quartz monzonite, and the non-granitic clasts are primarily carbonate rocks. The lower portion of the alluvial unit is comprised of approximately 90 percent granitic clasts and approximately 10 percent non-granitic clasts. During drilling of the borehole for intermediate casing, there was no evidence of saturation in the alluvium.

The Martin Formation was the first bedrock encountered at approximately 600 feet, continuing to 800 feet, and contained highly mineralized zones from approximately 640 to 660 feet, 690 to 720 feet, and 770 to 800 feet. The Upper Abrigo Formation was penetrated from approximately 800 to 1,100 feet, and contained highly mineralized zones from approximately 850 to 860 feet and 1,020 to 1,030 feet. The Middle Abrigo Formation was penetrated from approximately 1,100 to 1,270 feet and contained a siliceous interval from approximately 1,200 to 1,250 feet, and copper oxide mineralization at approximately 1,160 feet, 1,220 to 1,240 feet, and at 1,260 feet. The Lower Abrigo was encountered from approximately 1,270 feet to the total depth of 1,445 feet, and contained copper sulfides and a siliceous zone from approximately 1,350 to 1,390 feet. Penetration rates in the bedrock varied from approximately 0.9 to 6 minutes per foot. A detailed lithologic log is included in Appendix A.

## 2.20.4 Well Development

Airline development was conducted by BJ Drilling on 2 February 2015. BJ Drilling installed an airline at NSH-024 to approximately 800 feet and started airlifting at approximately 10 gpm. The well was airlifted and allowed to recover repeatedly at various rates. The airline was set to approximately 840 feet, 900 feet, 940 feet, and 1,000 feet, resulting in discharge rates varying between approximately 10 to 40 gpm. Discharge was initially cloudy to turbid and brown with up to 0.6 ml/L sand; but as development continued, discharge color cleared and sand content decreased. Field forms documenting well development are included in Appendix C.



#### 2.21 WELL NSH-025

Well NSH-025 was sited at location NSH-DP for the purpose of characterizing the sulfide zone within the interior of the structural block located between the Forty Mile, Great Sandy, and Atacama faults. Well NSH-025 was planned as a sulfide test well with completion in the Lower Abrigo Formation. NSH-025 is a 4-inch cased well design with a planned depth of 1,660 feet; the well was drilled by NEWP using the 685 drilling rig, and the air rotary method.

## 2.21.1 Drilling and Well Installation

Drilling activities for well NSH-025 commenced on 20 January 2015. A 20-inch diameter borehole was drilled to 20 feet, LCS surface casing with a 12-inch nominal diameter was installed to 20 feet, and neat cement grout was installed from 20 feet to land surface.

Borehole drilling continued on 20 January 2015 using a 10-inch diameter air-rotary hammer bit to a depth of 1,596 feet, and installation of well NSH-025 commenced on 24 January 2015 after geophysical logging was completed. Bentonite chips and fine sand (No. 20-40 mesh) were installed to approximately 1,560 feet to seal the bottom of the borehole. The well included 4-inch nominal diameter LCS; blank casing was installed to approximately 1,480 feet and the screened interval extended from 1,480 to 1,551 feet. Filter pack was installed to approximately 1,469 feet, transition sand was installed to 1,461 feet, and bentonite grout was installed to land surface on 26 January 2015. The top of the grout was observed to have dropped to approximately 20 feet on 8 February 2015; a 1-foot thick interval of bentonite chips was installed and Tacna gravel was installed to land surface.

Well construction field forms are included in Appendix B, an as-built well diagram for NSH-025 is included as Figure 20, and well construction details are summarized in Table I.

# 2.21.2 Geophysical Logging

A geophysical logging survey of the borehole for well NSH-025 was conducted by IDS-Colog and commenced on 23 January 2015 and included the following logs:

- Caliper/Gamma/Temperature/Conductivity,
- Electrical Resistivity,
- Sonic, and
- Acoustic Borehole Televiewer.

The geologic logs collected were used in the interpretation of the lithology and were utilized by Excelsior to expand their geologic model. Interpretation of flow logging will be summarized in the aquifer testing report. Copies of the geophysical logs are included in Appendix D.

## 2.21.3 Lithology

The bottom of the alluvium was encountered at approximately 610 feet. Penetration rates in the alluvium were generally between approximately 0.5 and 1.0 minute per foot. The alluvium consists of approximately 50 percent granitic clasts and approximately 50 percent non-granitic clasts to 310 feet. The lithology of the granitic clasts is consistent with the Texas Canyon quartz monzonite and the non-granitic clasts are primarily sedimentary and metamorphic rocks. The lower portion of the alluvial unit, from approximately 310 to 600 feet, is comprised of approximately 90 percent granitic clasts and approximately 10 percent non-granitic clasts.



The Martin Formation was the first bedrock encountered at a depth of interval from approximately 610 to 830 feet, and included altered carbonates. Penetration rates in the Martin Formation were generally between approximately 0.9 and 1.1 minutes per foot and no evidence of groundwater was observed during drilling.

The Upper Abrigo Formation was encountered at approximately 830 feet and penetration rates in the formation were between approximately 0.9 and 2.8 minutes per foot, and included tactite with iron and copper oxides. The Middle Abrigo was encountered from approximately 1,150 to 1,230 feet and included garnetite overlying the Lower Abrigo Formation from approximately 1,230 to 1,590 feet. Penetration rates in the Middle and Lower Abrigo formations were between approximately 1.0 and 4.0 minutes per foot. The Bolsa Quartzite was penetrated from approximately 1,590 to 1,596 feet and was hard (penetration rates were approximately 6 to 11 minutes per foot). A detailed lithologic log is included in Appendix A.

## 2.21.4 Well Development

Development of well NSH-025 included swab, bail, and pump activities by NEWP using a pump rig from 9 to 10 January 2015. A tightly fitting swab tool was reciprocated through the screened interval for approximately one hour; the solids were bailed out and a pump (Grundfos, model 40S 100-30) was set to 908 feet. During pumping, the discharge rate would decrease to approximately 2 gpm at a pumping water level at approximately 800 feet. By the end of the 3-day development period, the turbidity of the discharge was still turbid and sandy. Field forms documenting well development are included in Appendix C.

#### 2.22 WELL NSH-026

Well NSH-026 was sited at location NSH-BE for the purpose of characterizing the interior of the structural block located between the Forty Mile, Great Sandy, and Atacama faults. Well NSH-026 was planned as an upper oxide test well with for completion in the Escabrosa and Martin formations and was not planned to intersect any significant structures. NSH-026 is an open borehole interval design with a planned depth of 1,135 feet; the well was drilled by NEWP using the 50k drilling rig, and the air rotary method.

## 2.22.1 Drilling and Casing Installation

Drilling activities for well NSH-026 commenced on 23 January 2105. A 20-inch diameter borehole was drilled to 20 feet, LCS surface casing with a 14-inch nominal diameter was installed to 20 feet, and neat cement was installed to land surface.

Borehole drilling continued on 23 January 2015 using a 13-inch diameter air-rotary hammer bit to a depth of 625 feet. Originally planned for 1,135 feet, well NSH-026 was terminated before reaching the planned depth due to borehole instability and abundant fracturing. Installation of intermediate casing in well NSH-026 commenced on 24 January 2015. The intermediate casing included 8-inch nominal diameter LCS casing installed from approximately 625 feet to land surface. Bentonite chips were installed to 612 feet, and high-solids bentonite grout was installed to land surface. The intermediate casing installation was completed on 25 January 2015.

Drilling of bedrock commenced on 25 January 2015 with a 7%-inch hammer bit. The borehole was drilled to a total depth of approximately 905 feet on 26 January 2015.



On 17 March 2015, the level of grout in the annulus was observed to have dropped to approximately 70 feet. A 5-foot thick interval of %-inch bentonite chips was installed and Tacna gravel was installed to surface.

Well construction field forms are included in Appendix B, an as-built well diagram for NSH-026 is included as Figure 21, and well construction details are summarized in Table I.

## 2.22.2 Geophysical Logging

A geophysical survey of the open borehole completion interval of well NSH-026 was conducted by IDS-Colog on 26 January 2015. The geophysical survey included the following logs:

- Caliper/Gamma/Temperature/Conductivity,
- Sonic,
- Electrical Resistivity,
- Acoustic Borehole Televiewer,
- Neutron, and
- Gamma-Gamma Density.

Flow testing was conducted at NSH-026 on 20 February 2015, after pump development was completed. Ambient flow meter testing was performed with a CDFM tool and dynamic flow testing was performed with a spinner flow meter tool. Injection was started at approximately 80 gpm, then increased to 85 gpm and continued for approximately 2 hours. Spinner logs were run during the injection at 40 feet per minute. The spinner tool was also used to log stop counts at select depths. The well was then allowed to recover for approximately 1 hour. The flow logging survey included the following logs:

CDFM: Ambient,

Spinner: Ambient,

Spinner: Injection (average was 84.34 gpm, 40 feet/min), and

Spinner: Stop counts.

The geologic logs collected were used in the interpretation of the lithology and were utilized by Excelsior to expand their geologic model. Interpretation of flow logging will be summarized in the aquifer testing report. Copies of the geophysical logs are included in Appendix D.

#### 2.22.3 Lithology

The bottom of the alluvium was encountered at approximately 600 feet. Penetration rates in the alluvium were generally between approximately 0.4 and 1.4 minutes per foot. The upper portion of alluvium, to approximately 310 feet, is comprised of approximately 50 percent granitic clasts and 50 percent non-granitic clasts. The lithology of the granitic clasts is consistent with the Texas Canyon quartz monzonite, and the non-granitic clasts are primarily carbonate. The lower portion of the alluvial unit is comprised of approximately 90 percent granitic clasts and approximately 10 percent non-granitic clasts. The alluvium did not appear saturated during drilling.

The Escabrosa Formation was the first bedrock encountered at approximately 600 feet, continuing to approximately 700 feet, and consisted of white marble and grey limestone. The Abrigo Formation was encountered at approximately 700 feet and consisted of altered and oxidized carbonates with copper



mineralization from 730 to 740 feet and 810 to 830 feet. Penetration rates in the Escabrosa and Abrigo formations were generally between approximately 0.9 to 1.8 minutes per foot; however, some intervals were as slow as 2.2 minutes per foot. A detailed lithologic log is included in Appendix A.

## 2.22.4 Well Development

On 7 February 2015, BJ Drilling attempted to develop NSH-026 by airlift. No discharge was observed with the airline set at depths of 780, 820, and 860 feet. The well was bailed for approximately 1 hour. The bailed water appeared clear to slightly cloudy with a slight reddish color and included a minor amount of foam. Field forms documenting well development are included in Appendix C.

#### 2.23 WELL NSH-027

Well NSH-027 was sited at location NSH-BG for the purpose of characterizing the interior of the structural block located between the Forty Mile, Mojave #1, and Great Sandy faults. Well NSH-027 was planned to be completed as a lower oxide test well with completion in the Upper Abrigo Formation. Well NSH-27 was planned to intersect the Mojave #1 fault. NSH-027 is a 4-inch cased hole design with a planned depth of 1,037 feet; the well was drilled by NEWP using the 50k drilling rig and the air rotary method.

## 2.23.1 Drilling and Well Installation

Drilling activities for well NSH-027 commenced on 26 January 2015. A 20-inch diameter borehole was drilled to 20 feet, LCS surface casing with a 14-inch nominal diameter was installed to 20 feet, and neat cement grout was installed from 20 feet to land surface.

Borehole drilling continued on 27 January 2015 using a 12½-inch diameter air-rotary hammer bit to a depth of 1,022 feet. The first occurrence of groundwater during drilling was noted when drilling the 870- to 890-foot interval. At 970 feet, groundwater production increased to an estimated 300 gpm and varied depending on how much air pressure the driller was applying. The rate of groundwater production resulted in too much pressure for the air-rotary hammer to work properly and the hammer stopped functioning at 1,022 feet. Drilling was terminated at 1,022 feet depth.

Installation of well NSH-027 commenced on 29 January 2015 after geophysical logging was completed. The well included 6-inch nominal diameter LCS; blank casing was installed to 865 feet and the screened interval extended from 865 to 1,010 feet. The filter pack was installed from the bottom of the borehole to 850 feet, transition sand was installed to approximately 840 feet, high-solids bentonite grout was installed to 441 feet, bentonite chips were installed to 336 feet, and Tacna gravel was installed to land surface.

Well construction field forms are included in Appendix B, an as-built well diagram for NSH-027 is included as Figure 22, and well construction details are summarized in Table I.

## 2.23.2 Geophysical Logging

A geophysical survey of the borehole for well NSH-027 was conducted by IDS-Colog and commenced on 29 January 2015. The geophysical survey was completed 16 December 2014 and included the following logs:



- Caliper/Gamma/Temperature/Conductivity,
- Electrical Resistivity,
- Sonic, and
- Acoustic Borehole Televiewer.

The geologic logs collected were used in the interpretation of the lithology and were utilized by Excelsior to expand their geologic model. Copies of the geophysical logs are included in Appendix D.

## 2.23.3 Lithology

The bottom of the alluvium was encountered at approximately 490 feet. Penetration rates in the alluvium were generally between approximately 0.4 and 1.5 minutes per foot. The alluvium consists of sand with gravels with the top section, from land surface to 310 feet, being mixed lithics containing approximately 50 percent granitic clasts from the Texas Canyon quartz monzonite and 50 percent nongranitic clasts consisting primarily of sedimentary and metamorphic rocks. From 310 to 490 feet, the alluvium consists of approximately 90 percent granitic clasts and 10 percent non-granitic clasts.

The Martin Formation was the first bedrock encountered at approximately 490 feet and continued to 810 feet. The penetration rates in the Martin Formation were between approximately 1.0 and 1.6 minutes per foot. Significant fracturing was encountered from 700 to 800 feet. Below the Martin Formation was the Upper Abrigo Formation from 810 to 1,022 feet. Penetration rates for the Upper Abrigo Formation were between approximately 0.8 and 4.1 minutes per foot. Interpretations of ABI data revealed high angle fault between 975 to 982 feet and 989 to 993 feet. A detailed lithologic log is included in Appendix A.

## 2.23.4 Well Development

Pump development of well NSH-027 was conducted on 7 and 8 February 2015. A submersible pump (Grundfos, model #85S200-18) was installed to a depth of 849 feet. Pumping commenced at the maximum capacity of the pump and flow rates generally decreased with drawdown. NSH-027 was developed for approximately 13 hours at rates varying from 18 to 85 gpm. Maximum drawdown during development was approximately 183 feet. At the end of the development period, the water was cloudy and free of sand. Field forms documenting well development are included in Appendix C.

## 2.24 WELL NSH-028

Well NSH-028 was sited at location NSH-BH for the purpose of characterizing the interior of the structural block located between the Forty Mile, Mojave #1, and Great Sandy faults. Well NSH-028 was planned as an upper oxide test well with completion in the Martin Formation in a zone of bedding parallel structures. Well NSH-028 is an open borehole interval design with a planned depth of 820 feet; the well was drilled by NEWP using a 50k drilling rig and the air rotary method.

# 2.24.1 Drilling and Casing Installation

Drilling activities for well NSH-028 commenced on 27 January 2015. A 20-inch diameter borehole was drilled to 20 feet, LCS surface casing with a 14-inch nominal diameter was installed to 20 feet, and neat cement grout was installed to land surface.



Borehole drilling continued on 27 January 2015 using a 13-inch diameter air-rotary hammer bit to a depth of 544 feet. Directly below the alluvium, an interval of large fractures was encountered resulting in lost circulation from 500 to 530 feet. Heavy mud was pumped down the borehole to stabilize the borehole while drilling through this interval and circulation was recovered at approximately 535 feet. The borehole for the intermediate casing was deepened into competent bedrock to approximately 544 feet on 27 January 2015.

Installation of intermediate casing in well NSH-028 was completed on 28 January 2015 and included 8-inch nominal diameter LCS casing installed to 544 feet. Bentonite chips were installed to 541 feet, neat cement was installed to 473 feet, and high-solids bentonite grout was installed to land surface.

Drilling of bedrock commenced on 28 January 2015 with a 7%-inch hammer bit. The borehole was drilled to a total depth of approximately 800 feet on 29 January 2015.

On 31 January 2015, the level of the cement/grout in the annulus was observed to have dropped to approximately 90 feet. Tacna gravel was installed to land surface.

Well construction field forms are included in Appendix B, an as-built well diagram for NSH-028 is included as Figure 23, and well construction details are summarized in Table I.

## 2.24.2 Geophysical Logging

A geophysical logging survey of the open borehole interval of well NSH-028 was conducted by IDS-Colog on 29 January 2015. The geophysical survey included the following logs:

- Caliper/Gamma/Temperature/Conductivity,
- Electrical Resistivity,
- Sonic,
- Acoustic Borehole Televiewer,
- Neutron, and
- Gamma-Gamma Density.

Flow testing was conducted at NSH-028 on 21 February 2015. Ambient flow testing was performed with a CDFM tool. Injection was started at approximately 3.4 gpm, then adjusted to approximately 3.1 gpm, and continued for a total of 2.5 hours. During the injection, the CDFM tool was run at intervals of interest. The well was then allowed to recover for approximately 2 hours. The flow logging survey included the following logs:

- CDFM: Ambient, and
- CDFM: Injection (average injection rate was 3.23 gpm between 30 and 160 minutes).

The geologic logs collected were used in the interpretation of the lithology and were utilized by Excelsior to expand their geologic model. Interpretation of flow logging will be summarized in the aquifer testing report. Copies of the geophysical logs are included in Appendix D.



## 2.24.3 Lithology

The bottom of the alluvium was penetrated at approximately 500 feet. Penetration rates in the alluvium were generally between approximately 0.4 and 0.9 minute per foot. The upper portion of alluvium (to approximately 300 feet) is comprised of approximately 50 percent granitic clasts and approximately 50 percent non-granitic clasts. The lithology of the granitic clasts is consistent with the Texas Canyon quartz monzonite, and the non-granitic clasts are primarily carbonate rocks. The lower portion of the alluvial unit is comprised of approximately 90 percent granitic clasts and approximately 10 percent non-granitic clasts. During drilling of the borehole for the intermediate casing, there was no evidence of saturation in the alluvium.

The interval immediately below the alluvium consisted of large open fractures causing the drill to lose circulation and no drilled cuttings were recovered for this interval. Below the lost circulation zone, the Martin Formation was penetrated completely from 530 to 790 feet. Zones of moderate fracturing were noted from approximately 670 to 700 feet and 725 to 740 feet, mostly parallel to bedding planes. One structure is noted to dip west at approximately 725 feet. The Abrigo Formation was encountered from 790 feet to the bottom of the borehole. Penetration rates in the Martin and Abrigo formations were generally between approximately 0.6 to 1.9 minutes per foot. A detailed lithologic log is included in Appendix A.

## 2.24.4 Well Development

Several rounds of development were conducted on NSH-028 by both BJ Drilling and NEWP due to scheduling demands and rig availability. On 4 February 2015, BJ Drilling Company set up on NSH-028 to conduct airlift development. The airline was installed to approximately 760 feet and the well was initially purged at approximately 5 gpm for 1 hour. Following the initial purge, the well was repeatedly airlifted and allowed to recover. The discharge was initially brown and turbid with foam and contained 0.5 to 1.5 ml/L solids (sand and gravel). By the end of the airlifting development, no foam was observed in the groundwater, turbidity had decreased, and the sand content was approximately 0.2 ml/L.

On 5 February 2015, NEWP installed a submersible pump (Grundfos, model 40S 100-30) to approximately 750 feet. On 6 February 2015, the well was purged at approximately 30 gpm. The pumping rate was adjusted to approximately 1 gpm and pumped for 2 hours. The rate was then increased to approximately 2 gpm and pumped for 1.5 hours. At the end of the development period, total drawdown was approximately 125 feet. Field forms documenting well development are included in Appendix C.

#### 2.25 WELL NSH-029

Well NSH-029 was sited to serve as a water level observation point for aquifer testing. Well NSH-029 was planned for completion in the Martin Formation with the intention of monitoring groundwater elevation during pumping tests conducted at wells NSH-018 and NSH-020. NSH-029 is 2-inch piezometer design with a planned depth of 710 feet; the well was drilled by BJ Drilling using the T3 drilling rig and the air rotary method.



## 2.25.1 Drilling and Well Installation

Drilling activities for well NSH-029 commenced on 28 January 2015. An 11-inch diameter borehole was drilled to 19 feet, LCS surface casing with a 7-inch nominal diameter was installed to 19 feet, and neat cement was installed from 19 feet to land surface.

Borehole drilling continued on 28 January 2015 using a 6½-inch diameter air-rotary hammer bit to a depth of 710 feet. Installation of well NSH-029 commenced on 29 January 2015 (no geophysical logging was conducted). The well included 2-inch nominal diameter LCS; blank casing was installed to approximately 604 feet and the screened interval extended from 604 to 709 feet. Filter pack was installed from approximately 575 to 710 feet, bentonite chips were installed to 554 feet, and formation stabilizer (¾-inch pea-gravel and Tacna gravel) was installed to land surface.

Well construction field forms are included in Appendix B, an as-built well diagram for NSH-029 is included as Figure 24, and well construction details are summarized in Table I.

## 2.25.2 Lithology

The bottom of the alluvium was encountered at approximately 500 feet. Penetration rates in the alluvium were generally between 0.5 and 1.1 minutes per foot. The alluvium consists of approximately 50 percent granitic clasts and 50 percent non-granitic clasts to 290 feet. The lithology of the granitic clasts is consistent with the Texas Canyon quartz monzonite and the non-granitic clasts are primarily sedimentary and metamorphic rocks. The lower portion of the alluvial unit, from 290 to 500 feet, is comprised of approximately 90 percent granitic clasts and 10 percent non-granitic clasts.

The Martin Formation was the first bedrock encountered at approximately 500 feet to the total depth of 710 feet. Penetration rates in the Martin Formation were generally between approximately 1.0 and 1.8 minutes per foot. A detailed lithologic log is included in Appendix A.

## 2.25.3 Well Development

Development of well NSH-029 included bailing conducted by BJ Drilling using a pump rig from 8 to 9 February 2015. Airlift development was attempted but the airline was not submerged enough to discharge water. A total of approximately 5 gallons was bailed from the well before the well bailed dry. By the end of the development period, the turbidity of the discharge appeared very cloudy. Field forms documenting well development are included in Appendix C.

## 2.26 WELL NSH-030

Well NSH-030 was sited to serve as a water level observation point for aquifer testing. Well NSH-030 was planned for completion in the Escabrosa Formation with the intention of monitoring groundwater elevation during pumping tests conducted at wells NSH-018 and NSH-020. NSH-030 is a 2-inch piezometer design with a planned depth of 740 feet; the well was drilled by BJ Drilling using a T3 drilling rig and the air rotary method.



## 2.26.1 Drilling and Well Installation

Drilling activities for well NSH-030 commenced on 29 January 2015. An 11-inch diameter borehole was drilled to 19 feet, LCS surface casing with a 7-inch nominal diameter was installed to 19 feet, and neat cement grout was installed to land surface.

Borehole drilling continued on 29 January 2015 using a 6½-inch diameter air-rotary hammer bit to a depth of 740 feet. Installation of well NSH-030 commenced on 3 February 2015 (no geophysical logging was conducted. The well included 2-inch nominal diameter LCS; blank casing was installed to approximately 600 feet and the screened interval extended from 600 to 706 feet. Filter pack was installed from 592 to 740 feet, bentonite chips were installed to 567 feet, and formation stabilizer (¾-inch pea-gravel) was installed to land surface.

Well construction field forms are included in Appendix B, an as-built well diagram for NSH-030 is included as Figure 25, and well construction details are summarized in Table I.

## 2.26.2 Lithology

The bottom of the alluvium was encountered at 330 feet. Penetration rates in the alluvium were generally between approximately 0.5 and 0.8 minute per foot. The alluvium consists of approximately 50 percent granitic clasts and 50 percent non-granitic clasts. The lithology of the granitic clasts is consistent with the Texas Canyon quartz monzonite and the non-granitic clasts are primarily sedimentary and metamorphic rocks.

The Horquilla Formation was encountered immediately below the alluvium from 330 feet to 420 feet, and included fine-grained limestone/marble. Penetration rates in the Horquilla were generally between approximately 1.3 and 3.3 minutes per foot. Underlying the Horquilla Formation, the Black Prince Formation was penetrated at approximately to 560 feet, and included fine- to medium-grained limestone. Beneath the Black Prince, the Escabrosa Formation was penetrated at approximately to the bottom of the borehole at approximately 740 feet and included fine-grained limestone and marble. A detailed lithologic log is included in Appendix A.

## 2.26.3 Well Development

Development of well NSH-030 included bailing conducted by BJ Drilling on 8 and 22 February 2015. Airlift development was attempted but the airline was not submerged enough to discharge water. A total of approximately 7 gallons was bailed from the well before the well bailed dry. By the end of the development period, the turbidity of the discharge appeared turbid. Field forms documenting well development are included in Appendix C.

#### 2.27 WELL NSH-031

Well NSH-031 was sited to serve as a water level observation point for aquifer testing. Well NSH-031 was planned for completion in the Abrigo Formation with the intention of monitoring groundwater elevation during pumping tests conducted at wells NSH-007, NSH-008, NSH-009, NSH-010, and NSH-014B. NSH-031 was a 2-inch piezometer design with a planned depth of 820 feet; the well was drilled by BJ Drilling using the T3 drilling rig and the air rotary method.



## 2.27.1 Drilling and Well Installation

Drilling activities for well NSH-031 commenced on 4 February 2015. An 11-inch diameter borehole was drilled to 19 feet, LCS surface casing with a 7-inch nominal diameter was installed to 19 feet, and neat cement was installed to land surface.

Borehole drilling continued on 4 February 2015 using a 6½-inch diameter air rotary hammer bit to a depth of 820 feet. Installation of well NSH-031 commenced on 5 February 2015 (no geophysical logging was conducted). The well included 2-inch nominal diameter LCS; blank casing was installed to approximately 721 feet and the screened interval extended from 721 to 805 feet. Filter pack was installed to 700 feet, bentonite chips were installed to 683 feet to prevent the high-solids bentonite grout from flowing downward. Installation of the high-solids bentonite grout from 500 feet to land surface was completed on 6 February 2015.

Well construction field forms are included in Appendix B, an as-built well diagram for NSH-031 is included as Figure 26, and well construction details are summarized in Table I.

## 2.27.2 Lithology

The bottom of the alluvium was encountered at approximately 420 feet. Penetration rates in the alluvium were generally between approximately 0.2 and 1.0 minute per foot. The upper portion of alluvium to 320 feet is comprised of approximately 50 percent granitic clasts and 50 percent non-granitic clasts. The lithology of the granitic clasts is consistent with the Texas Canyon quartz monzonite and the non-granitic clasts are primarily sedimentary and metamorphic rocks. The lower portion of the alluvial unit is comprised of approximately 90 percent granitic clasts and 10 percent non-granitic clasts.

The Martin Formation was the first bedrock encountered at approximately 420 feet, continuing to 620 feet, and included fine- to medium-grained marble and garnetite. Penetration rates in the Martin were generally between approximately 0.9 and 1.1 minutes per foot. The Upper Abrigo was encountered at 620 feet to the bottom of the borehole at 820 feet. A possible fault zone was encountered between approximately 620 and 640 feet at the top of the Upper Abrigo Formation. The Abrigo Formation included altered carbonates; a second possible fault zone was encountered between approximately 740 and 760 feet. A detailed lithologic log is included in Appendix A.

## 2.27.3 Well Development

Development of well NSH-031 included bailing conducted by Haley & Aldrich on 7 March 2015. Prior to bailing, the water level was measured at approximately 563 feet. A total of approximately 23 gallons was bailed from the well. By the end of the development period, the turbidity of the discharge appeared turbid to cloudy; the water level was measured at approximately 580 feet and was observed to be rising after bailing was complete. Field forms documenting well development are included in Appendix C.

## 2.28 WELL NSH-032

Well NSH-032 was sited as a water level observation point for aquifer testing. Well NSH-032 was planned for completion in the Abrigo Formation with the intention of monitoring groundwater elevation during pumping tests conducted at wells NSH-007, NSH-008, NSH-009, NSH-010, and NSH-014B. The planned depth of well NSH-032 was 820 feet; the well was drilled by BJ Drilling using the T3 drilling rig, and the air rotary method.



## 2.28.1 Drilling and Well Installation

Drilling activities for well NSH-032 commenced on 6 February 2015. An 11-inch diameter borehole was drilled to 19 feet, LCS surface casing with a 7-inch outside diameter (0.155-inch wall thickness) was installed to 19 feet, and neat cement was installed from 19 feet to land surface.

Borehole drilling continued on 8 February 2015 using a 6½-inch diameter air rotary hammer bit to a depth of 820 feet; installation of well NSH-032 commenced on 9 February 2015. The well included 2-inch nominal diameter LCS; blank casing was installed to approximately 720 feet and the screened interval extended from 720 to 804 feet. Filter pack was installed from total depth to 700 feet, transition sand was installed to 690 feet, and high-solids bentonite grout was installed to land surface on 10 February 2015.

Well construction field forms are included in Appendix B, an as-built well diagram for NSH-032 is included as Figure 27, and well construction details are summarized in Table I.

# 2.28.2 Lithology

The bottom of the alluvium was encountered at approximately 420 feet. Penetration rates in the alluvium were generally between approximately 0.4 and 1.0 minute per foot. The upper portion of alluvium to approximately 320 feet is comprised of approximately 50 percent granitic clasts and approximately 50 percent non-granitic clasts. The lithology of the granitic clasts is consistent with the Texas Canyon quartz monzonite and the non-granitic clasts are primarily sedimentary and metamorphic rocks. The lower portion of the alluvial unit (below approximately 320 feet) is comprised of approximately 90 percent granitic clasts and approximately 10 percent non-granitic clasts.

The Martin Formation was the first bedrock encountered at approximately 420 feet, continuing to 620 feet, and included fine- to medium-grained marble and garnetite. Penetration rates in the Martin were generally between approximately 0.5 and 0.9 minute per foot. A possible fault zone was encountered between approximately 620 and 640 feet overlying the Abrigo Formation from approximately 620 feet to the bottom of the borehole at approximately 820 feet. The Abrigo Formation included altered carbonates with trace amounts of copper oxide minerals. A detailed lithologic log is included in Appendix A.

## 2.28.3 Well Development

Development of well NSH-032 included bailing conducted by NEWP and airlift conducted by BJ Drilling. Bailing was not successful on 18 February 2015 and the well was airlifted developed on 23 and 24 February 2015. The well was developed by the airlift method for a total of approximately 5 hours and the purge rate was approximately 1 gpm. By the end of the development period, the turbidity of the discharge appeared cloudy to clear. Field forms documenting well development are included in Appendix C.



# 3. Corehole Development Summary

A total of 35 existing coreholes were attempted to be developed by airlift methods so that they may be used as observation points during aquifer testing and during monthly and quarterly data collection events conducted by Excelsior. Work for the corehole development program was contracted to BJ Drilling by Excelsior and conducted between 20 November 2014 and 27 March 2015. Haley & Aldrich tracked the progress of the corehole development program and provided various levels of contractor oversight based on direction from Excelsior. More oversight was provided early in the corehole development program and less oversight was provided as the program progressed.

Initial work at each corehole included the contractor welding a diverter to the surface casing of the corehole to control the airlift discharge from the corehole. A pump hoist rig was used to install 1½-inch nominal diameter, flush-threaded steel tubing (through the diverter) to between approximately 900 to 1,100 feet to provide enough submergence to discharge water. An air compressor rig was used to conduct the airlift development.

In general, the initial period of airlift was continuous and generally extended several hours to remove drilling fluids from the corehole. After drilling fluids were purged, the airlift pumping was periodically stopped to allow the water level in the corehole to recover and surge to assist in development of the corehole. Each corehole was considered developed once the discharge from the corehole was continuous and cloudy to clear in appearance. The duration of the period required to develop each corehole varied from several hours to several days. Some coreholes could not be developed by the airlift method possibly due to enlarged corehole diameters or due to a lack of hydraulic connection to the formation. Some coreholes did not develop uniformly; at some locations, the discharge was turbid at the end of the development period.

Corehole development activities are summarized on Table III. Field data collected from corehole development activities early in the development program are presented in Appendix E. Analysis of the water level data collected form the coreholes are summarized in the aquifer testing report.



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TABLE I
Well Construction Summary
Gunnison Copper Project
Excelsior Mining Corp.

Well ID	Planned Hole ID	ADWR Registration Number	State Plane Coordinates		Drilling Start	Construction		Borehole	Borehole diameter, inches	Screened Interval <sup>1</sup>
			Easting	Northing	Date	Complete Date	Well Design	Depth (feet bgs)	(Depth Interval, feet)	(feet)
NSH-007	NSH-CP	55-917430	536953.072	394847.35	10/16/2014	10/23/2014	Open Borehole Interval (with PVC liner)	620	18 (0-20) 12 (20-469) 7 7/8 (469-640)	469-460 (PVC liner 356-496, 536-616)
NSH-008	NSH-CQ	55-917429	537052.423	395046.862	10/24/2014	10/29/2014	4- inch Cased	900	20 (0-20) 10 (20-900)	720-840
NSH-009	NSH-CS	55-917433	537651.191	395519.311	10/30/2014	11/8/2014	4-inch Cased	1,060	20 (0-20) 10 (20-1060)	813-995
NSH-010	NSH-CT	55-917434	537800.757	395448.292	10/30/2014	11/3/2014	Open Borehole Interval (with PVC liner)	720	20 (0-20) 13 (20-546) 7 7/8 (546-720)	546-720 (PVC liner 379-599, 693-699)
NSH-012	NSH-CU	55-917435	537951.517	395496.694	11/3/2014	11/20/2014	4-inch Cased	504	20 (0-20) 10 (20-504)	430-490
NSH-013	NSH-BW	55-917436	538252.445	394296.808	11/3/2014	11/7/2014	Open Borehole Interval	1,070	20 (0-20) 13 (20-650) 7 7/8 (650-1,070)	650-1,070
NSH-014B	NSH-DN	55-917432	537863.293	395535.279	11/10/2014	11/22/2014	4-inch Cased	1,277	20 (0-20) 10 (20-1,002) 9 7/8 (1,002-1,277)	1,180-1,260
NSH-015	NSH-CJ	55-224029	537801.792	393098.33	11/11/2014	11/15/2014	Open Borehole Interval	820	20 (0-20) 12 (20-585) 7 7/8 (585-820)	585-820
NSH-016	NSH-CL	55-224030	537654.299	393133.292	11/15/2014	11/19/2014	Open Borehole Interval (with PVC liner)	820	20 (0-20) 13 (20-580) 7 7/8 (580-820)	580-820( PVC liner 301 601, 641-701)
NSH-017	NSH-CK	55-224099	537953.722	393116.061	11/19/2014	12/7/2014	6-inch Cased	1,200	20 (0-20) 12 (20-930) 11 5/8 (930-1200)	940-1181
NSH-018	NSH-CV	55-224100	539882.712	394345.762	11/23/2014	12/21/2014	4-inch Cased	997	20 (0-20) 10 (20-960) 9 7/8 (960-997)	610-992
NSH-019	NSH-DA	55-224031	538350.895	393394.81	12/7/2014	12/21/2014	Open Borehole Interval	1,410	20 (0-20) 13 (20-638) 7 7/8 (638-1188) 7 1/2 (1188-1410)	N/A
NSH-020	NSH-CX	55-224035	539881.346	394183.965	12/8/2014	12/20/2014	4-inch Cased	1,600	20 (0-20) 10 (20-1130) 9 7/8 (1130-1600)	1060-1181, 1241-1402, 1472-1582
NSH-021C	NSH-DB	55-224032	538373.959	393462.015	1/10/2015	2/8/2015	Open Borehole Interval	1,400	20 (0-20) 13 (20-624) 7 7/8 (624-1400)	624-1,400



# TABLE I Well Construction Summary Gunnison Copper Project Excelsior Mining Corp.

Well ID	Planned Hole ID	ADWR Registration Number	State Plane Coordinates		Drilling Start	Construction		Borehole	Borehole diameter, inches	Screened Interval <sup>1</sup>
			Easting	Northing	Date	Complete Date	Well Design	Depth (feet bgs)	(Depth Interval, feet)	(feet)
NSH-022	NSH-BF	55-224097	539336.194	392996.22	12/20/2014	1/19/2015	6-inch Cased	1,170	20 (0-20) 12 (20-660) 11 7/8 (660-835) 11 5/8 (835-1170)	1,010-1,131
NSH-023	NSH-DD	55-224034	538600.754	393545.935	1/14/2015	1/17/2015	Open Borehole Interval	1,446	20 (0-20) 13 (20-645) 7 7/8 (645-1446)	645-1,446
NSH-024	NSH-DC	55-224033	538538.574	393510.798	1/18/2015	1/22/2015	Open Borehole Interval	1,445	20 (0-20) 13 (20-625) 7 7/8 (625-1445)	625-1,445
NSH-025	NSH-DP	55-224158	538490.268	393644.068	1/20/2015	1/26/2015	4-inch Cased	1,596	20 (0-20) 10 (20-1596)	1,480-1,551
NSH-026	NSH-BE	55-224036	539341.942	392857.383	1/23/2015	1/26/2015	Open Borehole Interval	905	20 (0-20) 13 (20-625) 7 7/8 (625-905)	625-905
NSH-027	NSH-BG	55-224157	539011.455	391828.665	1/26/2015	2/1/2015	6-inch Cased	1,022	20 (0-20) 12 (20-1022)	865-1,010
NSH-028	NSH-BH	55-224156	539065.387	391979.953	1/27/2015	1/29/2015	Open Borehole Interval	800	20 (0-20) 13 (20-544) 7 7/8 (544-800)	544-800
NSH-029	NSH-DR	55-917775	539877.409	393898.717	1/28/2015	1/29/2015	Piezometer	710	11 (0-19) 6.5 (19-710)	604-709
NSH-030	NSH-DQ	55-917777	539886.861	394642.092	1/29/2015	2/3/2015	Piezometer	740	11 (0-19) 6.5 (19-740)	600-706
NSH-031	NSH-DS	55-917782	537432.527	395949.843	2/4/2015	2/6/2015	Piezometer	820	11 (0-19) 6.5 (19-820)	721-805
NSH-032	NSH-DT	55-917783	537746.449	395755.033	2/6/2015	2/10/2015	Piezometer	820	11 (0-19) 6.5 (19-820)	720-804

## NOTES:



<sup>&</sup>lt;sup>1</sup> Open borehole interval for feasbility design wells

# TABLE II Geophysical Logging Summary Gunnison Copper Project

Excelsior Mining Corp.

Well ID	Caliper Gamma T/FR	Sonic	E log	АВІ	Neutron	Density (Gam-Gam)	Ambient Flowmeter (type)	Dynamic Flowmeter (type)
NSH-007	Х			Х				
NSH-008	Х	Х	Х	Х	Х	×	Heat Pulse Flow Meter	
NSH-009	Х	Х	Х	Х	Х	Х	CEDFM	CDFM
NSH-010	Х	Х	Х					
NSH-011	Х	Х	Х					
NSH-012	Х							
NSH-013	Х	Х	Х	Х	Х	Х	CDFM	CDFM
NSH-014B	Х	Х	Х					
NSH-015	Х	Х	Х	Х	Х	Х	CDFM	SPM
NSH-016	Х	Х	Х	Х			CDFM	
NSH-017	Х	Х	Х	Х			CDFM	CDFM
NSH-018	Х	Х	Х	Х			CDFM	CDFM
NSH-019	Х	Х	Х	Х	Х	X	CDFM	SFM
NSH-020	Х	Х	Х	Х			CDFM	CDFM
NSH-021C	Х	Х	Х	Х			CDFM	SFM
NSH-022	Х	Х	Х	Х				
NSH-023	Х	Х	Х	Х	Х	Х	CDFM	CDFM
NSH-024	Х	Х	Х	Х			CDFM	CDFM
NSH-025	Х	Х	Х	Х				_
NSH-026	Х	Х	Х	Х	Х	Х	CDFM	SFM
NSH-027	Х	Х	Х	Х				
NSH-028	Х	Х	Х	Х	Х	Х	CDFM	CDFM

**Note:** CDFM - Corehole Dynamic Flow Meter (Electromagnetic flow meter tool for low flow conditions)

SPM - Spinner Flow Meter (mechanical tool for high flow conditions)

TABLE III
Corehole Cleanout Summary
Gunnison Copper Project
Excelsior Mining Corp.

ID	Cleanout Date(s)	Total Well Depth (feet bgs)	Airline Depth (feet bgs)	Pre-cleanout SWL (feet bgs)	Post-cleanout SWL (feet bgs)	Discharge** (gpm)	Total Water Purged (gallons)	Construction Details
NSD-030	11/21-22/14	767	756	358	238.86	<1 to 10	3,000	Cased to 240' bgs, open hole below
NSD-037	12/5-9/2014	1,200	440 to 945 [800]	352.3	461.7*	10 to 90	2,500	Cased to 524' bgs, open hole below
NSD-026	12/9/2014	1,168	504 to 525 [525]	416.5	419.2*	10	1,500	Cased to 431' bgs, open hole below
NSD-002	12/10-12/2014	1,907	600 to 1250 [1250]	575.9*	591.7*	1.5 to 40	4,500	Cased to 580' bgs, open hole below
NSD-001	12/12-13/2014	1,509	800 to 1220 [1220]	605.5*	612.4*	<10 to 20	1,200	Cased to 460' bgs, open hole below
NSD-041	12/13-14/14	1,600	1,220	546	529.7*	30 to 40	13,200	Cased to 410' bgs, open hole below
NSD-042	12/15-16/14	1,700	1,220	Blocked*	Obstruction at 510	5 to 15	900	
NSM-009	12/16-17/14	1,349	1,220	602	593.9*	35 to 40	12,000	Cased to 585' bgs, open hole below
NSM-005A	12/18-20/2014	1,171	1,000		588	10 to 15	5,900	Cased to 592' bgs, open hole below
NSM-043	12/20/2014	1,736	1,200			10 to 15	1,900	Cased to 628' bgs, open hole below
NSD-027	1/5-6/2015	1,004	960	453.9*	505.37*	15	2,700	Cased to 400' bgs, open hole below
NSD-028	1/7/2015	755	740	436.8*	444.97*	9	2,900	Cased to 400' bgs, open hole below
DC-9	1/12-13/15	1,500	600	359.2			rocarbon odor, immediately sed purging	<u> </u>
NSD-010	1/16/2015	1,509	940	564.5*	565.2*	<1 to 3.5	100+	Cased to 543' bgs, open hole below
NSM-011	1/19-20/2015	1,340	1,000	576.5*	577.84*	40	5,400	Cased to 540' bgs, open hole below
J-5	1/22-23/2015	1,475	600 to 1,100 [1100]	550	605.3*	1 to 7	2,300	<u> </u>
NSD-019	1/26/2015	1,454	1,100	485.1*	630.4*	20	5,800	Cased to 620' bgs, open hole below
NSM-007	1/27-28/2015	1,168	1,000	636	651.1*	10 to 15	6,300	Cased to 604' bgs, open hole below
NSD-001	1/29/2015	1,150	1,100	612.4*	616.2*	17 to 20	2,200	Cased to 458' bgs, open hole below
NSD-022	2/4-5/2015	1,339	Bailed at top of water Colum and ~1,250 [top of water column]	547.9*	555*	Bailer (3" ID x 20') rar	~15 times over 45 minutes	Cased to 499' bgs, open hole below
NSD-012	2/5-6/2015 1,732		900	536.6	538.1*	No returns noted, used bailer (1" x 20') to investigate (obstruction at 400' bgs)		Cased to 422' bgs, open hole below
NSD-006	2/6/2015	2,000	1,000	564.56	Block at 85*			Cased to 470' bgs, open hole below
NSM-008	2/10-11/15	1,250	900	Full of mud*	619.13*	20 to 22	10,400	Cased to 540' bgs, open hole below
NSM-006	2/13-16/2015	1,273	800	630.6*	641.45*	5	1,500	Cased to 548' bgs, open hole below
CS-6	2/16-18/2015	2,160 (926 after collapse)	Bailed at 795	643	646.2*	-	1.25	Hole collapsed at 936' bgs
NSD-011	2/18/2015	1,438	900 to 1,100 [1,100]	633	635.7*	3 to 5	500	Cased to 644' bgs, open hole below
NSM-001	2/19-20/2015	1,150	900	641	639.1*	1 to 3	500+	
CS-11	2/20/2015	2,084	900	446.2*	441*	1 to 2	600+	
NSD-032	<3/16/15	905	-	315.8*	333.95*	-	-	
NSD-017	3/16/2015	1,349	600	505.3	505.36	-	5	Cased to 400' bgs, open hole below
NSD-016	3/17-18/2015	1,689	780	540.17	540.1	<1 to 1	50	Cased to 420' bgs, open hole below
NSD-014	3/18/2015	1,913	900	540.9*	542.7	3	400	Cased to 402' bgs, open hole below
NSD-005	3/19/2015	1,908	900	495.6*	518.64	3 to 4	200+	Cased to 420' bgs, open hole below
NSM-010A	3/20/2015	839	800	Blocked at 210*	549.62		eturns noted	Cased to 425' bgs, open hole below
NSD-015	3/20/2015	1,956	795	539.5*	512.65	1 to 2	400	Cased to 400' bgs, open hole below
J-9	3/27/2015	1,158	700 to 1,100 [1,100]		637.7*		eturns noted	O 7 - 1 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2

# NOTES:

\* = from Excelsior water level sweeps

\*\* = visual approximation

[ ] = depth purging completed

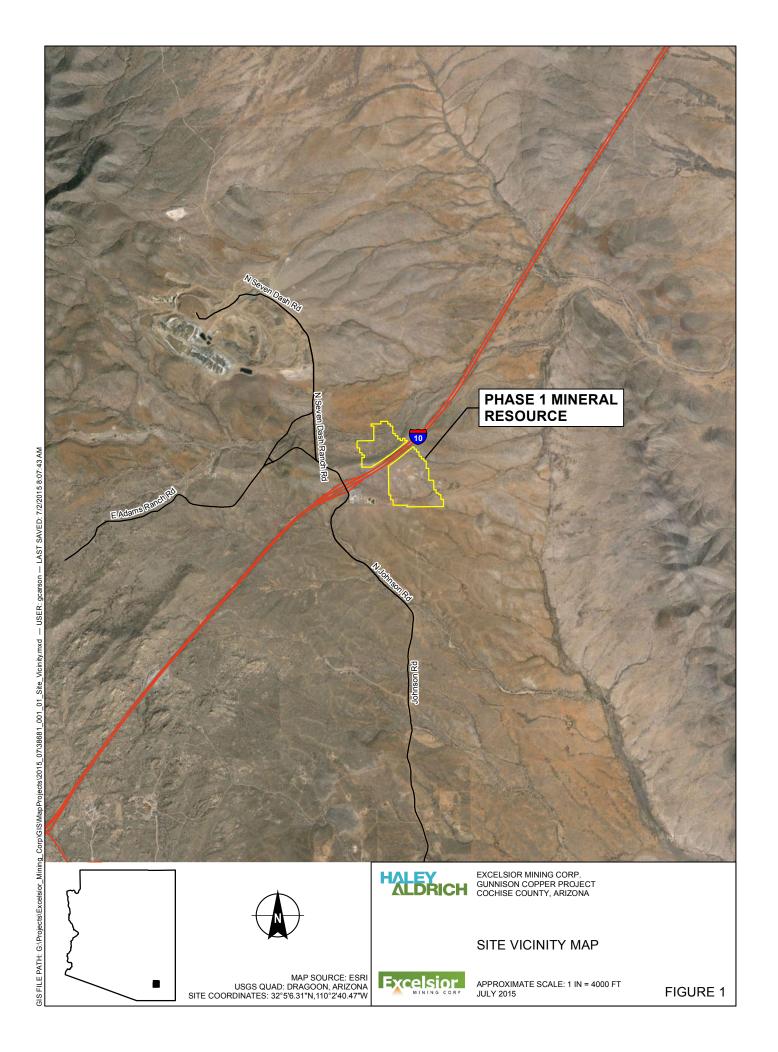
bgs = below ground surface

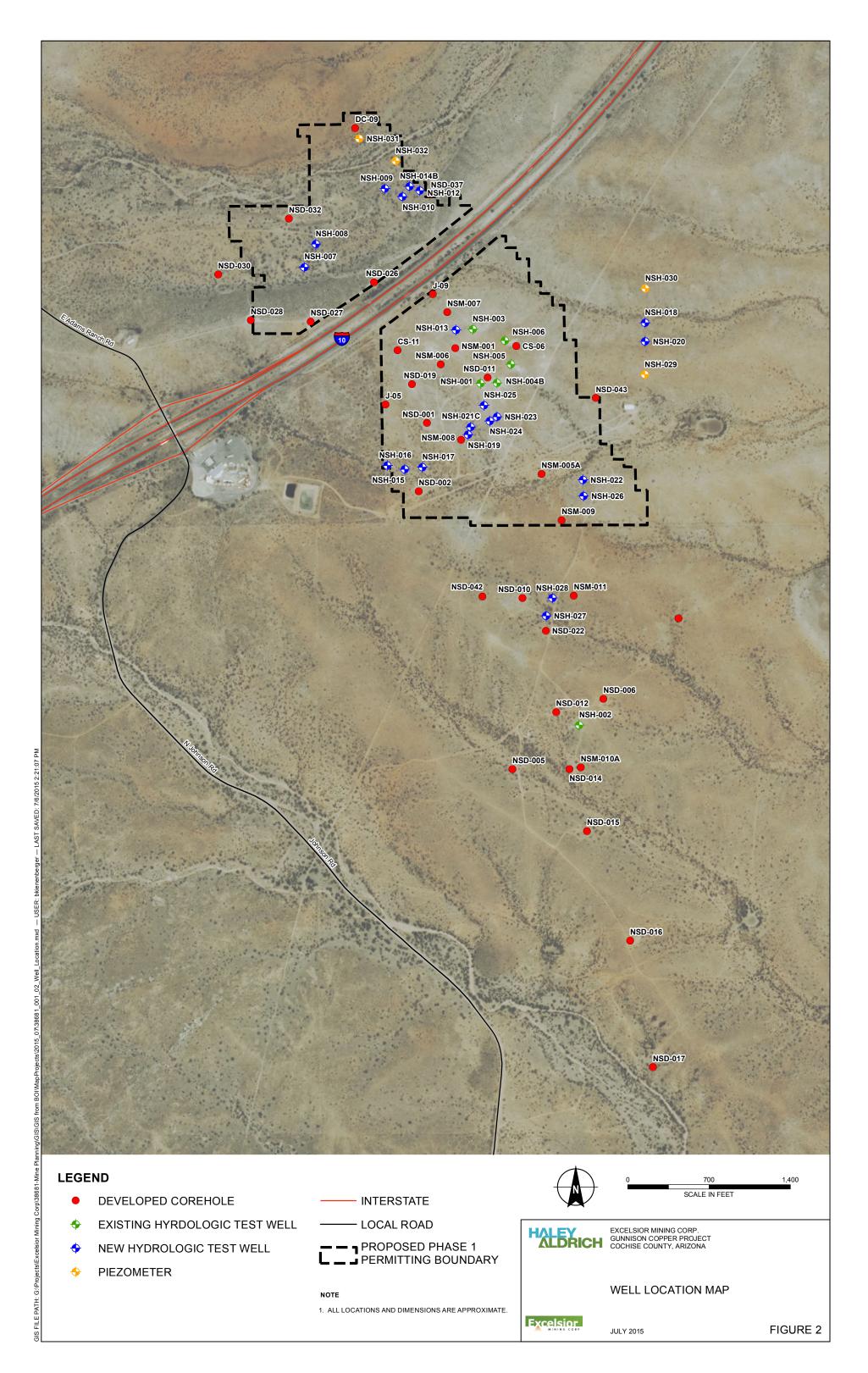
gpm = gallons per minute

SWL = surface water level



JULY 2015





SCALE: NONE JULY 2015

NSH-008 AS-BUILT DIAGRAM

SCALE: NONE JULY 2015

SCALE: NONE

JULY 2015

FIGURE 5

KUBOWSKI, TODD Printed: 7/6/2015 1:49 PM PROJECTS/EXCELSIOR MINING CORP\38681-MINE.

NSH-010 AS-BUILT DIAGRAM

SCALE: NONE JULY 2015



GUNNISON, ARIZONA

NSH-012 AS-BUILT DIAGRAM

SCALE: NONE JULY 2015

ANDERSEN, DANE Printed: 7/17/2015 1:45 PM L. G: IPROJECTS/EXCELSIOR MINING CORP/38681-MINE PL

SCALE: NONE JULY 2015

SCALE: NONE

JULY 2015

FIGURE 10

SCALE: NONE

JULY 2015

NSH-016 AS-BUILT DIAGRAM

SCALE: NONE JULY 2015

NSH-017 AS-BUILT DIAGRAM

SCALE: NONE JULY 2015

JAKUBOWSKI, TODD Printed: 7/6/2015 1:54 PM La G:PROJECTS/EXCELSIOR MINING CORP/38681-MINE PL

SCALE: NONE JULY 2015



NSH-020 AS-BUILT WELL DIAGRAM

SCALE: NONE JULY 2015

FIGURE 16

JULY 2015

NSH-022 AS-BUILT DIAGRAM

SCALE: NONE JULY 2015

ANDERSEN, DANE Printed: 7/2/2015 11:45 AM Layout: NSH-023 -

NSH-023 AS-BUILT DIAGRAM

SCALE: NONE JULY 2015

NSH-024 AS-BUILT DIAGRAM

SCALE: NONE JULY 2015

NSH-025 AS-BUILT DIAGRAM

SCALE: NONE JULY 2015

NSH-026 AS-BUILT DIAGRAM

SCALE: NONE JULY 2015



NSH-027 AS-BUILT DIAGRAM

SCALE: NONE JULY 2015

NSH-027 AS-BUILT DIAGRAM

SCALE: NONE JULY 2015

NSH-028 AS-BUILT DIAGRAM

SCALE: NONE JULY 2015

FIGURE 25

JULY 2015

SCALE: NONE JULY 2015

**APPENDIX A** 

**Lithology Logs** 



BORING LOG Page 1 of 2

Project Excelsior	Hole ID NSH-007				Location NSH-CP	
Project Number 38361	Lithology Described by J. Cook			ook	Date Started 10/16/14	Date Finished 10/23/14
Drilling Company National EWP	Geophysical Logging Co. COLOG			LOG	Site Elevation	
Drilling Equipment GEFCO Speedstar 50K	Geophysica Acous	al Logs stic Televie	wer		Water Level 330 feet (12/11/14)	
Drilling Method Air-rotary Hammer	Calipe				Total Depth 620	feet
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks	
CL, Clay with Sand (0 - 20 feet) Primarily silt and clay with ~15% fine to sand and trace gravel to ~6 mm. The sa gravel is subangular to subrounded. The have medium plasticity and toughness.  SW, Sand with Gravel (20 - 130 feet) Primarily coarse to medium sand with ~ gravel to ~25 mm. The sand and gravel subangular to subrounded and is compower ~50% granite and ~50% lithics. This into generally referred to as mixed lithics.  SW, Sand with Gravel (130 - 320 feet) Primarily coarse to medium sand with ~ gravel is subangular to subrounded is compounded is compounded is subangular to subrounded is compounded.	25% is rised of erval is	- 0 20 0 40 60 80 100 120 140 0 -	1.5 1.1 1.7 1.0 0.6 0.9 0.5 0.6	Strong	Drilled an 18-inch I cone bit and reame 16-2014 and instal carbon steel surface with a 20-foot cem surface seal.  All depths are belo Commenced drillin hammer bit on 10-	er to 20 feet on 10-led 14-inch low-ce casing to 20 feet ent-bentonite  w land surface. g with a 12-inch
gravel is subangular to subrounded, is of ~85% granite and ~15% lithics, and r weakly with HCl. The fines react strongl	eacts	- 160 - 0 - 180 180 200 220 0 - 240 260 280 0 280 0 280 0 280 0 280 0 280 0 280 0 280 0	0.6 0.5 0.6 0.7 0.7 0.8 0.7	Weak to strong		



BORING LOG Page 2 of 2

Project Excelsior	Hole ID	NSH-00	)7		Lithology Described by
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
SW, Sand with Gravel (130-320 feet)		- 300 -	1.75	Weak	
Martin Farmation (200, 470 fact)		- 320 -	3.6 1.3		
Martin Formation (320 -470 feet) Primarily dolomite, light tan to white col Cuttings include magnetite and other ire as well as minor copper oxides.		- 340 -	2.4 1.9		
		- 360 - 	2.3		
		- 380 -	2.4		
		- 400 - 	2.4		
		- 420 -	1.95		
		- 440 -	2.25		
		- 460 -	2.5		
Abrigo Formation (470 - 620 feet) Primarily light to dark green colored metasediments. Commonly referred to		- 480 - 	1.5		
tactite. Cuttings include pyrite, chrysoc copper sulfides, fluorite, and iron oxides	s. Minor	- 500 -	1.4		
manganese oxides and garnet also pre	SCIII.	520 -	0.85		
		 - 540 -			
			1.2	Weak	
	7	- 560 - 			
		- 580 - 	0.8		
		- 600 -			
		 - 620 -	1.0		



BORING LOG Page 1 of 3

Project Excelsior	Hole ID	NSH-008			Location NSH-CO	Q
Project Number 38681	Lithology Described by  B. Kienenberger			ger	Date Started 10/24/14	Date Finished
Drilling Company National EWP	Geophysica	l Logging (	Co. CC	LOG	Site Elevation 479	O feet
Drilling Equipment GEFCO Speedstar 50K	Geophysica Acous	l Logs tic Televie	wer		Water Level	
Drilling Method Air-rotary Hammer	Calipe				Total Depth 900	feet
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Ren	narks
CL, <u>Lean Clay with Sand</u> (0 - 30 feet)		- 0 -	0.55	Strong		
		- 20 - 	4.5			
SC, <u>Clayey Sand</u> (30 - 70 feet)		- 40 - 	0.65	Weak to strong		
		- 60 -	1.15	Strong		
SW, Sand with Gravel (70 - 310 feet)		- 80 -	1.10			
		 - 100 -	0.75			
		- 100 -	1.1			
		- 120 -				
		- - 140 -	1			
			1.05			
		- 160 - 				
		- 180 -		Weak to		
		 - 200 -		medium		
		- 200 -				
		- 220 -				
		 - 240 -				
		- 260 - 				
		- 280 -				
			1.4 0.4			



BORING LOG Page 2 of 3

Project Excelsior	Hole ID	NSH-008			Location NSH-CQ
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
		- 300 -	1.95		
Martin Formation (310 - 460 feet) Gray-colored dolomite/limestone mixed magnetite-bearing tactite. Other minera		- 320 -	1.05		
observed include copper oxides, iron ox minor amounts of chrysocolla.	ides, and	- 340 -	1.75		
		- 360 -	1.55		
		- 380 -		Strong	
		- 400 -	1.2		
		- 420 -	0.95		
		- 440 -	1.3		
Upper Abrigo Formation (460 - 560 feet)		- 460	1.55		
White and green-colored tremolite-acting tactite containing rhodochrosite, epidote oxides, and iron oxides.		- 480 -	1.4		
		- 500 -	1.05	Weak to	
		- 520 -		medium	
		- 540 -	1.1		
Middle Abrigo Formation (560 - 740 feet	t)	- 560 -	1.55		
Brown-colored garnet-epidote tactite wit amounts of rhodochrosite.	h minor	- 580 -	2.55		
		- 600 -	3.35	Medium to strong	
		- 620 -	2.9	Saong	
		- 640 -	1.85		



BORING LOG Page 3 of 3

Description    Depth (ft)	Project Excelsior	Hole ID	NSH-008			Location NSH-CQ
(initivit)	Description				HCl	Remarks
Middle Abrigo Formation (560 - 740 feet)   Brown-colored garnet-epidote tactitie with minor amounts of rhodochrosite.   1.5	Brown-colored garnet-epidote tactite with amounts of rhodochrosite.  Lower Abrigo Formation (740 - 900 feet) Black-colored hornfels with abundant quiveins. Other minerals observed include	h minor	- 680 700 720 740 740 780	1.5 3 4.55 0.95 1.85 2.95 2.15 2.6 1.9 1.6 1.85		Total depth 900'



BORING LOG Page 1 of 4

Project Excelsior	Hole ID	NSH-009			Location NSH-CS	3
Project Number 38681	Lithology Described by C. Price				Date Started 10/30/14	Date Finished
Drilling Company National EWP	Geophysica	l Logging C	Co. CC	LOG	Site Elevation 4750 feet	
Drilling Equipment GEFCO Speedstar 50K	Geophysica Acous	l Logs stic Televie	wer		Water Level	
Drilling Method Air-rotary Hammer	Calipe				Total Depth 1060	feet
Description	Depth (ft) Drill Reaction to HCl			HCl	Ren	narks
CL, <u>Sandy Lean Clay with Gravel</u> (0 - 20	) feet)	- 0 <i>-</i>		Weak to medium		
ML, <u>Sandy Silt</u> (20 - 40 feet)		- 20 -		Medium		
SW-SM, <u>Sand with Silt and Gravel</u> (40 -	160 feet)	- 40 - 	1.05			
		- 60 - 	0.65			
		- 80 -	0.5			
		 - 100 -	0.5			
			0.4			
		- 120 <i>-</i>	0.45			
		- 140 -	0.0			
		- 160 <i>-</i>	0.3			
ML, <u>Silt with Sand</u> (160 - 260 feet)			0.3	Strong		
		- 180 - 	0.3			
		- 200 -				
			0.6			
			0.35			
		- 240 -	0.45			
SW-SM, <u>Sand with Silt and Gravel</u> (260-	-480 feet)	- 260 -				
2 5, <u>sand man on and order (</u> 200	.00 1001)		0.6			
			0.4			



BORING LOG Page <u>2</u> of <u>4</u>

Project	Excelsior	Hole ID	NSH-009			Location NSH-CS
	Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
SW-SM, <u>S</u> feet)	Sand with Silt and Gravel (260-	480	- 300 -	0.6		
			- 320 -	0.6		
			- 340 -	0.7		
			- 360 -	0.6		
			- 380 -	0.8		
			- 400 -	0.7		
			- 420 -	1.2		
			- 440 -	1.2		
			- 460 -	1.5		
Escabrosa White-cold oxides.	a Formation (480-520 feet) ored marble containing minor i	ron	- 480 -	1.6		
oxides.			- 500 -  - 520 -	1.2		
Gray and	rmation (520-660 feet) white-colored dolomite and lim n magnetite-bearing tactite. O	estone	- 540 -	1.5		
minerals p	oresent include minor amounts a, rhodochrosite, serpentine, ind d manganese oxides.	of	- 560 -	1.4		
Oxideo din	a manganese oxides.		- 580 -	0.6		
			- 600 -	2.4		
			- 620 -	2.2		
			- 640 -	1		
				1.1		



BORING LOG Page 3 of 4

Project Excelsior	Hole ID	NSH-009			Location NSH-CS
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
Upper Abrigo Formation (660-790 feet) Green-colored amphibole-chlorite tactit with rhodochrosite,magnetite, garnet, ir and manganese oxides.	e/hornfels	- 660 -  - 680 -  - 700 -	0.9		
		- 720 - - 740 - - 760 -	0.8		
Middle Abrigo Formation (790-1000 fee Brown-colored garnet-epidote tactite wi amounts of grossularite and fluorite.	t) th minor	- 780 - - 800 -	1.3 1.5 1.6		
		- 820 - - 840 - - 860 -	3.3 3.2 4.5		
		- 880 -  - 900 -  - 920 -	4.1 5.3		
		- 940 - - 960 -	5.2 4.4		
			3.1		



BORING LOG Page 4 of 4

Project Excelsior	Hole ID	NSH-009			Location NSH-CS
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
Lower Abrigo Formation (1000-1060 for Black-colored hornfels with abundant of veins and minor iron oxides.	eet) quartz	- 1020 -  - 1040 - 1060 -	1.9		Total Depth 1060'
					Total Depth 1060'



BORING LOG Page 1 of 3

Project Excelsior	Hole ID	NSH-010			Location NSH-CT	-
Project Number 38681	Lithology Described by D. Andersen, C. Barnes				Date Started 10/30/14	Date Finished 11/3/2014
Drilling Company National EWP	Geophysica	l Logging C	Co. CO	LOG	Site Elevation 4760	) feet
Drilling Equipment GEFCO Speedstar 50K	Geophysica Acous	l Logs tic Televie	wer		Water Level	
Drilling Method Air-rotary Hammer	Calipe Natura	er al Gamma			Total Depth 720 f	eet
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Ren	narks
CL, Sandy Lean Clay with Gravel (0 - 10	) feet)	- 0 -		Strong		
SM, Silty Sand with Gravel (10 - 40 feet)	1	- 20 - 		Weak		
SP-SM, <u>Sand with Silt and Gravel</u> (40 - 7	70 feet)	- 40 - 60 -	0.6	Strong		
SW, <u>Sand with Gravel</u> (70 - 180 feet)		- 80 -	0.55			
		 - 100 -	0.55			
			0.5			
		- 120 -	0.55			
		- 140 -				
		- 160 -				
			0.6	Weak		
SM, <u>Silty Sand</u> (180 - 230 feet)		- 180 - ·	0.7			
		- 200 -				
		- 220 -	0.6			
SW-SM, Sand with Silt (230-400 feet)			0.8			
2.1. 3.1., <u>34.14 (233 133 133)</u>		- 240 -	0.95			
		- 260 -				
		- 280 -	0.65			
			1.15 0.4			



BORING LOG Page 2 of 3

Project Excelsior	Hole ID	NSH-010			Location NSH-CT
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
SW-SM, Sand with Silt (230-400 feet)		- 300 -	4.05	-	
		- 320 -	1.05	-	
			1.4		
		- 340 -	1.95		
		- 360 -	1.95		
			0.85		
		- 380 -			
		- 400 -	1.15	Weak	
SP-SM, Sand with Silt (400 - 490 feet)			1.8		
		- 420 -	1.0		
		- 440 -	1.2		
			1.35		
		- 460 -	2.25		
		- 480 -	2.23	-	
		-	1.3		
Escabrosa Formation (490 - 610 feet) White-colored marble with minor garnet	tite.	- 500 -	1.05	-	
		- 520 -	1.05	-	
			1		
		- 540 -	1.45	-	
		- 560 -	1.43	-	
			0.9		
		- 580 -	0.9	•	
		- 600 -	0.0		
Martin Formation (610 - 720 feet)			0.6		
Gray-colored dolomite/limestone mixed magnetite-bearing tactite. Other minera		- 620 -	1.2		
observed includeepidote, cuprite, fluorit chrysocolla, rhodocrosite, copper oxide	e,	- 640 -			
manganese oxides and iron oxides.	-,		1.75		



BORING LOG Page 3 of 3

Project Hole ID Location Excelsior NSH-010 NSH-CT Drill Reaction to **Depth** Description Remarks Rate **HCl** (ft) (min/ft) Martin Formation (610 - 720 feet) 660 Gray-colored dolomite/limestone mixed with 1.5 magnetite-bearing tactite. Other minerals observed includeepidote, cuprite, fluorite, 680 chrysocolla, rhodocrosite, copper oxides, 1.3 manganese oxides and iron oxides. 700 1.4 720 Total Depth 720'



BORING LOG Page 1 of 2

Project Excelsior	Hole ID	NSH-012			Location NSH-Cl	J
Project Number 38681	Lithology Described by C. Barnes				Date Started 11/8/14	Date Finished 11/10/14
Drilling Company National EWP	Geophysica	l Logging C	Co. CO	LOG	Site Elevation	
Drilling Equipment GEFCO Speedstar 50K	Geophysica Acous	l Logs tic Televie	wer		Water Level	
Drilling Method Air-rotary Hammer	Calipe				Total Depth 504	feet
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Ren	narks
GW-GM, Gravel with Silt and Sand (0 -	40 feet)	- 0 -				
		- 20 -		Strong		
SW-SM, Sand with Silt and Gravel (40 -	160 feet)	- 40 - 	0.5			
		- 60 -				
		 - 80 -	0.8			
			0.6	Strong		
		- 100 - 	0.7			
		- 120 -				
		- - 140 -	0.8			
GW, <u>Gravel with Sand</u> (160 - 502 feet)			0.4			
		- 160 - 	0.6			
		- 180 -				
		 - 200 -	0.5			
			0.8	Weak to		
		- 220 - 	0.9	medium		
		- 240 -				
		 - 260 -	0.5			
			0.4			
		- 280 - 	0.3			



BORING LOG Page <u>2</u> of <u>2</u>

Project Excelsior	Hole ID	NSH-012			Location NSH-CU	
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks	
GW, <u>Gravel with Sand</u> (160 - 502 feet)		- 300 - 	0.5			
		- 320 -	0.35			
		- 340 -	0.05			
		- 360 -	0.85			
		- 380 -	0.45			
		- 400 -	0.8			
		- 420 -	0.85			
		- 440 -	2			
		- 460 -	1.3			
		- 480 -	1.75			
		- 500 -	1.1			
Escabrosa Formation (502-504 feet) White-colored marble with mixed garne	etite.		0.35	Strong	Total Depth 504'	
		- 520 -				



BORING LOG Page 1 of 4

Project Excelsior	Hole ID	NSH-013			Location NSH-CJ	
Project Number 38361	Lithology Described by C. Barnes				Date Started 11/3/14	Date Finished 11/7/14
Drilling Company National EWP	Geophysica	l Logging C	Co. CC	LOG	Site Elevation	
Drilling Equipment GEFCO Speedstar 50K	Geophysical Logs Acoustic Televiewer				Water Level 654.66 feet (12/19/2014)	
Drilling Method Air-rotary Hammer	Caliper Natural Gamma				Total Depth 1070 feet	
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Ren	ıarks
GP-GC, Poorly-graded Gravel with Clay Sand (0 - 600 feet)	'and	- 0	2 0.6 0.65 0.7 0.7 0.7 0.9 1.4 0.9 0.85			



Project Excelsior	Hole ID	NSH-013			Location NSH-CJ
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
GP-GC, <u>Poorly-graded Gravel with Cla</u> Sand (0 - 600 feet)	y and	- 300 -	1.05		
		- 320 -	0.55		
		- 340 -	0.75		
		- 360 -	1.1		
		- 380 -	0.9		
		- 400 -	1.2		
		- 420 -	1.2		
		- 440 -	0.9		
		- 460 -			
		- 480 -			
		- 500 -			
		- 520 -			
		- 540 -	0.6		
		- 560 -	0.7		
		- 580 -	0.8		
Martin Formation (600 - 800 feet)		- 600 -	1		
Martin Formation (600 - 800 feet) Brown-gray colored dolomite/limestone with magnetite-bearing tactite.	mixed	- 620 -	1.8		
		- 640 - 	2.35		



Project Excelsion		Hole ID	NSH-013	3		Location NSH-CJ
	Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
Martin Formation (6 Brown-gray colored with magnetite-bea	d dolomite/limestone	mixed	- 660 - - 680	- 1.1		
-			- 000	1.15		
			- 700 -	_ 1.1		
			- 720	- 1.15		
			- 740	1.15		
			- 760	-		
			- - 780	- 1.3		
			- 800			
Escabrosa Formati Gray-green colored with minor amounts manganese oxides	d amphibole tactite/hos of iron oxides and	ornfels	- 820	1.2		
Martin Formation (8	240 050 foot)		- 840	- 1.0		
Brown-gray colored with magnetite-bea	I dolomite/limestone ring tactite, with mod	erate	- 860	1.4	•	
amounts of copper	oxides and iron oxid	es.	- 880	- 1.1		
			-	- 1.8		
			- 900 -	- 1.6		
			- 920 -	- 1.7		
			- 940 	- 1.3		
Cream-white colore	mation (950 - 1000 fe ed quartz monzonite	with	- 960	_ 1.5		
minor amounts of ir alteration.	on oxides and potas	SIC	- 980	-		
			- - 1000	1.5		
			-	1.6		



**Project** Hole ID Location Excelsior NSH-013 NSH-CJ Drill **Reaction to Depth Description** Remarks Rate HCl (ft) (min/ft) Martin Formation (1000 - 1050 feet) 1020 Brown-gray colored dolomite/limestone mixed 2.1 with magnetite-bearing tactite, with minor 1040 amounts of copper oxides and iron oxides. 1.8 Texas Canyon Formation (1050 - 1060 feet) 1060 Cream-white colored quartz monzonite with 1.6 Total Depth 1070' minor amounts of iron oxides and potassic alteration. Martin Formation (1060 - 1070 feet) Brown-gray colored dolomite/limestone mixed with magnetite-bearing tactite, with minor amounts of iron oxides.



Project Excelsior	Hole ID	NSH-014E	3		Location NSH-D	N
Project Number 38361	Lithology Described by C. Barnes				Date Started	Date Finished 11/19/14
Drilling Company National EWP	Geophysica	l Logging C	Co. CC	LOG	Site Elevation	
Drilling Equipment 685K	Geophysica Acous	l Logs stic Televie	wer		Water Level	
Drilling Method Air-rotary Hammer	Calipe				Total Depth 127	7 feet
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks	
GC, <u>Clayey Gravel with Sand</u> (0 - 50 fee	et)	- 0 - 20 - - 40 -	2.2 0.7 0.5	Strong	Dry drilling for BHA 20" hole opener 0- 10" hammer 20-99 9 7/8" ticone 997-1	20 ft. 97 ft.
GW, Gravel with Sand (50 - 490 feet)		- 60 - 60 - 60 - 60 - 60 - 60 - 60 - 60	0.3 0.3 0.3	Medium to strong		



Project Excelsior	Hole ID	NSH-014B			Location NSH-DN
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
GW, <u>Gravel with Sand</u> (50 - 490 feet)		- 300 - ·  - 320 - ·	0.4		
		- 340	0.4		
		- 360	0.4		
		- 400  - 420			
		- 440	1.1		
Martin Formation (490 - 645 feet)		- 480	1.4		
Gray-colored dolomite/limestone mixed magnetite-bearing tactite. Other minera observed include copper oxides, manga oxides, and iron oxides.	ls	- 520 -	0.9		
		- 540  - 560	1.75	Medium to	
		- 580	2	strong	
		- 620	1.9		
			1.4		



Project Hole ID Location Excelsior NSH-014B NSH-DN Drill **Reaction to Depth Description** Remarks Rate **HCl** (ft) (min/ft) <u>Upper Abrigo Formation</u> (645 - 960 feet) 660 Green-colored amphibole-chlorite 0.9 tactite/hornfels. Other minerals observed include epidote, rhodochrosite, copper oxides, and iron 680 oxides. 1.45 700 2.85 720 1.95 740 1.95 760 2.3 780 Weak 800 to 3.6 medium 820 2.6 840 2.6 860 2.8 880 2.8 900 2.9 920 2.8 940 960 Middle Abrigo Formation (960 - 1000 feet) 2.9 Brown-colored garnet-epidote tactite. 980 Strong 3 1000 23.4



Project Excelsior	Hole ID	NSH-014E	3		Location NSH-DN
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
Lower Abrigo Formation (1000 - 1277 fe Black-colored hornfels with abundant qu	eet)	- 1020 -			
veins, and minor to moderate amounts	of iron	 - 1040 -	14.4		
oxides.		- 1040 -	7.6		
		- 1060 -			
			22.6		
		- 1080 -	22.6		
		- 1100 -			
			9		
		- 1120 -	17.8		
		- 1140 -		Medium	
			14.5		
		- 1160 -	45		
		 - 1180 -	15		
			14.1		
		_ 1200 _			
		_ 1220 _	10.7		
			48.1		
		- 1240 -			
		 - 1260 -	15.7		
			21		
		- 1280 -			Total Depth 1277'



Project Number   38361	Project Excelsior	Hole ID	NSH-015			Location NSH-C	J
Drilling Company	Project Number 38361	Lithology D	Described by	K. F	ord		
Description	Drilling Company National EWP	Geophysica	l Logging C	Co. CO	LOG		
Description	Drilling Equipment GEFCO Speedstar 50K			wer		Water Level 592	feet (11/21/14)
Comparison   Com	Drilling Method Air-rotary Hammer	Calipe	er			Total Depth 820	feet
SP, Sand with Gravel (20 - 240 feet)  - 40 - 1.3 - 60 - 0.5 - 80 - 0.5 - 100 - 0.4 - 140 - 140 - 0.5 - 160 - 0.5 - 160 - 0.5 - 180 - 0.5 - 100 - 0.4 - 140 - 0.5 - 160 - 0.5 - 100 - 0.5 -	Description		( <b>f</b> 4)	Rate	HCl	Ren	narks
0.5 medium - 280 - 0.5			- 0	1.3 0.5 0.4 0.4 0.5 0.4 0.5 0.5 0.5	Medium to strong  Weak to	20" hole opener 0-	20 ft.



Project Excelsior	Hole ID	NSH-015			Location NSH-CJ
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
		- 300 -	0.6		
		- 320 -	0.6		
		- 340 -	0.8		
			1.1		
		- 360 -	1.1		
Texas Canyon Quartz Monzonite (370 -	800 feet)	- 380 -			
		- 400 -	1.4		
			1.4		
		- 420 -	1.25		
		- 440 -	1.20		
		- 460 -	1.45		
		- 400	1		
		- 480 -	1.4		
		- 500 -	1.4		
			1.5		
		- 520 - 			
		- 540 -			
		 - 560 -			
			1.35		
		- 580 - 			
		- 600 -			
		620 -			
			0.85		
		- 640 - 	1	•	



Project Excelsior	Hole ID	NSH-015			Location NSH-CJ
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
Middle Abrigo Formation (800 - 820 fee Brown-colored garnetite mixed with wh		- 660 680 700 720 740 760 780 780 820 820 820 820 760	1.5 1.4 1.1 1.1 1.2 2.15 1.7 1.3	Medium	Total depth of boring is 820 feet.



BORING LOG Page <u>1</u> of <u>3</u>

Project Excelsior	Hole ID	NSH-016			Location NSH-Cl	-
Project Number 38361	Lithology D	escribed by	K. F	ord	Date Started 11/15/14	Date Finished 11/19/14
Drilling Company National EWP	Geophysica	l Logging C	o. co	LOG	Site Elevation	
Drilling Equipment GEFCO Speedstar 50K	Geophysica Acous	l Logs tic Televie	wer		Water Level 330	feet (11/19/14)
Drilling Method Air-rotary Hammer	Calipe				Total Depth 820	feet
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Ren	narks
SC, <u>Clayey Sand</u> (20 - 30 feet) SW, <u>Sand with Gravel</u> (30 - 260 feet)		- 0 20 40 60 -	0.35	Medium to strong	Dry drilling for BHA 20" hole opener 0-: 13" hammer 20-58 8" hammer 580-82	20 ft. 0 ft.
		- 80 100 120 160 180 200	0.6 0.45 0.5 0.8 0.55 0.65 0.75	Strong		
SW, <u>Sand</u> (260-400 feet)		- 220 240 260 280 280 -	0.6 1.1 0.9	None to weak		



Project Excelsior	Hole ID	NSH-016			Location NSH-CL
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
SW, <u>Sand</u> (260-400 feet)		- 300 -			
		- 320 -	1.4		
			1.1		
		- 340 -	1.05		
		- 360 -	1.25		
			1.05		
		- 380 -			
		- 400 -	0.75		
Texas Canyon Formation (400 - 820 fee Cream-white-pink colored quartz mozor	et) nite with		0.85		
secondary potassium feldspar and mino amounts of fluorite.	or Man	- 420 -			
arround of hadrice.		- 440 -	0.85		
			0.9		
		- 460 -	0.95		
		- - 480 -	0.95		
			0.95		
		- 500 -			
		- 520 -	1.05		
				None	
		- 540 -		to weak	
			1.15		
		- 560 - 	1.05		
		- 580 -			
		600 -			
		- 620 -			
		 - 640 -			
			0.9		



Project Hole ID Location Excelsior NSH-016 NSH-CL Drill Reaction to **Depth** Description Remarks Rate **HCl** (ft) (min/ft) <u>Texas Canyon Formation</u> (400 - 820 feet) Cream-white-pink colored quartz mozonite with secondary potassium feldspar and minor 660 1.0 amounts of fluorite. 680 1.1 700 1.75 720 2.85 740 2.0 760 1.7 780 1.8 800 1.3 Total depth of boring is 820 feet. 820



Project Excelsior	Hole ID	NSH-017			Location NSH-CF	<
Project Number 38361	Lithology Described by K. Ford				Date Started 11/19/14	Date Finished 12/7/14
Drilling Company National EWP	Geophysica	l Logging C	co.	LOG	Site Elevation	
Drilling Equipment GEFCO Speedstar 50K	Geophysica Acous	l Logs stic Televie	wer		Water Level 591	feet (12/14/14)
Drilling Method Air-rotary Hammer	Calipe		-		Total Depth 1200	) feet
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Ren	narks
SC, Clayey Sand with Gravel (0 - 20 fee SW, Sand with Gravel (20 - 420 feet)	rt)	- 0 -  - 20 -		Weak	Dry drilling for BHA 18" hole opener 0-: 12" hammer 20-93 11 7/8" tricone 930	20 ft. 0 ft.
,		- 40 - - 60 -	0.6			
		- 80 - - 100 -	0.9			
		- 120 - - 140 -	0.6			
		- 160 - 	0.75	Weak		
		- 180 -  - 200 -		to strong		
		 - 220 -				
			1.15			
		- 240 - 				
		- 260 -				
		 - 280 -				
			0.9			



Project Excelsior	Hole ID	NSH-017			Location NSH-CK
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
SW, <u>Sand with Gravel</u> (20 - 420 feet)		- 300 -			
,		- 320 -	0.8		
			0.9		
		- 340 -	0.05		
		- 360 -	0.95		
			0.9		
		- 380 -			
		- 400 -	0.85		
			2.2		
Texas Canyon Formation (420 - 550 fee	<u>+</u> t)	- 420 -			
Cream-white colored quartz monzonite.	/	- 440 -	1.5		
			1.8		
		- 460 -			
		- 480 -	2.1		
			2.4		
		- 500 -		Weak	
		- 520 -	2.8		
			4.1		
		- 540 -	4.7		
Middle Abrigo Formation (550 - 630 feet	t)	- 560 -	1.7		
Dark brown-colored garnetite/garnet-epi tactite with copper oxides and small dike	es of		1.4		
Texas Canyon quartz monzonite.		- 580 -	4.4		
		- 600 -	1.4		
			1.4		
		- 620 -	4.05		
Texas Canyon Formation (630 - 720 fee	et)	- 640 -	1.85		
Cream-white colored quartz monzonite.			2.7		



Project Excelsior	Hole ID	NSH-017			Location NSH-CK
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
Texas Canyon Formation (630 - 720 fee Cream-white colored quartz monzonite.	et)	- 660 - 	3.6		
·		- 680 - 	2.45		
		- 700 - 	5.2		
Middle Abrigo Formation (720 - 740 feet Dark brown-colored garnetite/garnet-epi		- 720 - 	2.35		
tactite with local magnetite.  Texas Canyon Formation (740 - 760 fee Cream-white colored quartz monzonite	et)	- 740 -  - 760 -	3.8		
containing clasts of Middle Abrigo Forma Middle Abrigo Formation (760 - 780 feet Dark brown-colored garnetite/garnet-ep	:)	- 780 -	3.9		
tactite with local magnetite.  Texas Canyon Formation, Middle Abrigo		800 -	3		
Formation (780 - 830 feet) Cream-white colored quartz monzonite with brown-colored garnet tactite. Signification dikes of Texas Canyon quartz monzonit cutting the Middle Abrigo Formation.	mixed ficant	- 820 -	5.4 16.5		
Middle Abrigo Formation (830 - 1030 feet Dark brown-colored garnet-epidote tactite with dikes of Texas Canyon quart		- 840 -  - 860 -	9.85		
monzoite and quartz veins.		- 880 -	13.4		
		- 900 -			
		 - 920 -	9.6		
		 - 940 -	32		
		- 960 - 	29.4		
		- 980 -	11.4		
		- 1000 - 	1.7		



Project Excelsior	Hole ID	NSH-017			Location NSH-CK
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
		- 1020 -	1.45		
Lower Abrigo Formation (1030 - 1200 for Dark-gray to gray-colored hornfels mixe garnet-epidote tactite.	eet) d with	- 1040 - 	1.85		
		- 1060 -	1.3		
		- 1080 -	1.75		
		- 1100 -	1.25		
		- 1120 - 	6.5		
		_ 1140 _	13.2		
		- 1160 -	9		
		- 1180 -	2.7		Total doubt of basing in 4200 fact
		- 1200 -	3.6		Total depth of boring is 1200 feet.



BORING LOG Page <u>1</u> of <u>3</u>

Project Excelsior	Hole ID	NSH-018			Location NSH-C\	/
Project Number 38361	Lithology Described by C. Barnes, D. Huckle				Date Started 11/23/14	Date Finished 12/21/14
Drilling Company National EWP	Geophysica	l Logging C	Co. CO	LOG	Site Elevation	
Drilling Equipment Schramm 685	Geophysica	l Logs tic Televie	wer		Water Level 591	feet (12/21/14)
Drilling Method Air-rotary Hammer	Calipe				Total Depth 1000	) feet
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Ren	narks
SM, Silty Sand with Gravel (0 - 10 feet)		- 0 -	3.4		Dry drilling for BHA	
SM, Silty Sand (10 - 20 feet)		- 20 -	3.4		20" hole opener 0-2 10" hammer 20-96	20 ft.
CL, <u>Lean Clay with Sand</u> (20 – 30 feet)			1.7		9 7/8" tricone 960-	
SM, Silty Sand (30 - 40 feet)		- 40 -	3.0			
GW, Gravel with Sand (40 - 420 feet)			8.5			
		- 60 -	0.65			
		- 80 -	0.65			
			0.65			
		- 100 -				
			0.8			
		- 120 -	0.7			
		- 140 -	0.7			
			0.7			
		- 160 -				
				Weak		
		- 180 - 				
		- 200 -	0.70			
			0.55			
		- 220 -				
			0.9			
		- 240 - 	0.6			
		- 260 -				
			0.65			
		- 280 - 	0.8			



Project Excelsior	Hole ID	NSH-018			Location NSH-CV
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
GW, <u>Gravel with Sand</u> (40 - 420 feet)		- 300 -	0.7		
		- 320 -	0.6		
		- 340 -	0.85		
		- 360 -			
		- 380 -	0.5		
		- 400 -	0.25		
		- 420 -	1.0		
Black Prince Formation (420 – 980 feet) White-colored marble mixed with variou and garnet skarns. Minerals observed i	s tactites	- 440 -	1.2		
copper oxides and iron oxides	Holado		1.4		
		- 460 -	2.2		
		- 480 -	2.1		
		- 500 -	1.45		
		- 520 - 	1.25	Medium	
		- 540 -		to strong	
		- 560 -			
		_ 580 _			
		- 600 -	1.5		
		- 620 -			
		- 640 -	1.55		
			1.65		



Project Excelsior	Hole ID	NSH-018			Location NSH-CV
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
Black Prince Formation (420 – 980 feet) White-colored marble mixed with variou and garnet skarns. Minerals observed i	s tactites	- 660	2.7		
copper oxides and iron oxides		- 700 -	3.45		
		- 720 -	3.15		
		- 740 -	3.45		
		- 760 -  - 780 -			
		- 800 -	2		
		- 820 -	1.45		
		- 840 - 860 -	2.6		
		- 880 -	1.5		
		- 900 -	1.75 2.7		
		- 920 	10.4		
		- 940 -  - 960 -	27.2		
Tertiary Lamprolite? (980 – 990 feet)		- 980 -	30	None	Table back of last 1999 (
Black-colored fine-grained rock.  Black Prince Formation (990 – 1000 fee Pale green-colored tactite, likely basal F	et) Horquilla	- 1000 -	6.4	Medium	Total depth of boring is 1000 feet.



BORING LOG Page <u>1</u> of <u>5</u>

Project Excelsior	Hole ID	NSH-019			Location NSH-D	Α
Project Number 38361	Lithology I	Described by K. Mol			Date Started 12/7/14	Date Finished 12/15/14
Drilling Company National EWP	Geophysica	l Logging (	Co. CO	LOG	Site Elevation	
Drilling Equipment Speedstar 50K	Geophysica	l Logs stic Televie	wer		Water Level 602	feet (12/17/14)
Drilling Method Air-rotary Hammer	Calipe				Total Depth 1410	) feet
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Ren	narks
SM, Silty Sand with Gravel (0 - 40 feet)		- 0 -			Dry drilling for BHA	
		- 20 -			20" hole opener 0- 13" hammer 20-64 7 5/8" hammer 640	20 ft. 0 ft. 0-1190 ft.
CD Cond with Convol (40, 550 for a)		- 40 -			7 1/2" tricone 1190	ι-1410 π.
SP, <u>Sand with Gravel</u> (40 - 550 feet)		- 60 -	0.6			
		- 80 -	0.45			
		_ 100 _	0.6			
		- 120 -	0.55			
		- 140 -	0.45			
		- 160 -	0.5	Strong		
		- 180 -	0.45			
		- 200 -	0.6			
		- 220 -	0.55			
		- 240 - 	0.75			
		- 260 -	0.8			
		- 280 - 	0.7			



Project Excelsior	Hole ID	NSH-019			Location NSH-DA
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
SP, Sand with Gravel (40 - 550 feet)		- 300 -	0.6		
		- 320 -	0.55		
		- 340 -	1.05		
		- 360 -	0.5		
		- 380 -	0.4		
		- 400 -	0.5	None	
		- 420 -	0.6		
		- 440 -	0.6		
		- 460 -	0.3		
		- 480 -	0.55		
		- 500 -	0.55		
		- 520 -	0.7		
		- 540 -	1.2		
Martin Formation (550 - 710 feet) Brown-gray colored dolomite/limestone with magnetite-bearing tactite with copp	mixed er	- 560 -	0.95		
oxides.		_ 580 _	1.45		
		- 600 -	1.25	Strong	
		- 620 -	0.95		
		- 640	1.3 0.75		



Project Excelsior	Hole ID	NSH-019			Location NSH-DA
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
Martin Formation (550 - 710 feet) Brown-gray colored dolomite/limestone with magnetite-bearing tactite with copp oxides.		- 660 -  - 680 - 	0.95		
Upper Abrigo Formation (710 - 810 feet Green-colored actinolite-tremolite tactite local magnetite tactite and copper oxide	with	- 700 -  - 720 -  - 740 -	0.95		
		- 760 - - 780 - - 780 -	1.15 1.05	Medium to strong	
Martin Formation (810 - 850 feet) Brown-gray colored dolomite/limestone with magnetite-bearing tactite with copp		- 800 - 820 - - 840 -	1.15	Strong	
Upper Abrigo Formation (850 - 1020 fee Green-colored actinolite-tremolite tactite local magnetite tactite and copper oxide	with	- 860 - - 880 - - 880 -	1.15 1.45 0.9		
		- 900 - 920 - - 940 -		Medium to	
			2.3	strong	
		- 1000 - 	2.8		



Project Excelsior	Hole ID	NSH-019			Location NSH-DA
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
	eet)	Depth	Rate	HCl	
		- 1360	12.5		



BORING LOG Page <u>5</u> of <u>5</u>

Project Exc	celsior	Hole ID	NSH-019			Location NSH-DA
	Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
Lower Abrigo	Lower Abrigo Formation (1240 - 1410 feet)		- 1380 -  - 1400 -	31.3		Total depth of boring is 1410 feet.
				42.8		



BORING LOG Page <u>1</u> of <u>5</u>

Project Excelsior	Hole ID	NSH-020			Location NSH-CX		
Project Number 38361	Lithology Described by J. Cook				Date Started 12/8/14	Date Finished 12/20/14	
Drilling Company National EWP	Geophysica	l Logging C	<u>'0</u>	LOG	Site Elevation		
Drilling Equipment Schramm 685k	Geophysica	l Logs stic Televie	wer		Water Level 603 feet (12/16/2014)		
Drilling Method Air-rotary Hammer	Calipe				Total Depth 1600	) feet	
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Ren	narks	
Mixed Lithics Alluvium (0 - 300 Feet) 0 to 40 feet is primarily silty sand with approximately 30% fines and 10% grave 300 feet is primarily coarse sand and gr Majority of fine material has been washe sample from drilling. Approximately 50% sample consists of carbonate rocks with other 50% being granite or similar. Colo from white quartz, yellow carbonates, at gey to dark brown limestone or dolomite.	eavel.  ed out of  of the  the  r ranges  nd dark	- 0	4.5 0.6 0.7 0.6 0.7 0.8 0.8 0.6 0.7 0.7 0.8	Strong	Dry drilling for BHA 20" hole opener 0-: 10" hammer 20-11 9 7/8" tricone 1135	20 ft. 35 ft.	



Project Excelsior	Hole ID	NSH-020			Location NSH-CX
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
<u>Granitic Alluvium</u> (300 – 450 feet) Primarily coarse sand and gravel. Fines	may	- 300  - 320 -	0.8		
have been washed out of sample while drilling. Approximately 80% granite or s	imilar	- 320 -	0.8		
unit and 20% carbonate rocks. Color rai from tan to with with abundant quartz ar minor dark grey to brown carbonate roc	nd	- 340 -	0.9		
Some iron oxides present/		- 360 -	1.2	Weak	
		- 380 -	0.4		
		- 400 -	0.4		
		- 420 -			
		- 440 -	0.5		
Black Prince Formation (450 – 1170 fee Various pale green-white colored tactites with marble/limestone. Copper oxides o	s mixed	- 460 -	1.1		
from 1060-1120 feet.	3001100	- 480 -	1.9	•	
		- 500 -	1.4	Strong	
		- 520 -	1.7		
		- 540 -			
		- 560 -	1.4	•	
		580 -			
		600 -	2.8		
		- 620 -			
		- 640 -	1.9		



Project Hole ID Location Excelsior NSH-020 NSH-CX Drill Reaction to **Depth** Description Remarks Rate **HCl** (ft) (min/ft) 660 Black Prince Formation (450 - 1170 feet) 2.3 Various pale green-white colored tactites mixed with marble/limestone. Copper oxides 680 observed from 1060-1120 feet. 2.2 700 3.5 720 2.6 740 1.8 760 1.3 780 2.9 800 2.1 820 3.4 840 2.2 860 3.8 880 1.4 900 -1.2 920 1.0 940 1.1 960 1.6 980 1.4 1000 1.6



Project Excelsior	Hole ID	NSH-020	NSH-020		Location NSH-CX
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
Black Prince Formation (450 – 1170 fe	Black Prince Formation (450 – 1170 feet)			-	
			1.3		
		- 1040 -	1.5		
		- 1060 -			
			1.7		
		- 1080 -			
		- 1100 -	2.2		
			1.4		
		- 1120 -			
		- 1140 -	1.8		
		- 1140 -	1.7		
		- 1160 -			
Escabrosa Formation (1170 – 1550 feet White-colored coarse-grained marble will brown/black tactites.	) ith local	- 1180 -	1.8		
3.5.11.7.5.0.5.1		- 1200 -	1.9	-	
		-	1.9		
		- 1220 -	2	-	
		- 1240 -		-	
		- 1260 -		-	
		 - 1280 -	3.0		
			3.2		
		- 1300 -		-	
		- 1320 - 		1	
		- 1340 -		_	
		- 1360 -	3.2		
			6.2		



BORING LOG Page <u>5</u> of <u>5</u>

Project Excelsior	Hole ID	NSH-020			Location NSH-CX
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
Escabrosa Formation (1170 – 1550 feet)		- 1380	6.1		
		- 1400 - - 1420	2.7		
		- 1440 -	2.4		
		- 1460 -	2.9		
		- 1480 -	2.9		
		- 1500 -  - 1520 -	4.0		
		- 1540 -	3.5		
Martin Formation? (1550 – 1600 feet) Gray-cream colored fine-grained dolomite/limestone with minor magnetite	9.	- 1560 -	3.4		
		- 1580 -  - 1600 -	6.7		Total depth of boring is 1600 feet.



Project Excelsior	Hole ID	NSH-021E	3		Location NSH-DE	3
Project Number 38361	Lithology Described by K. Mohr				Date Started 12/15/14	Date Finished 12/18/14
Drilling Company National EWP	Geophysical Logging Co. COLOG				Site Elevation	
Drilling Equipment Speedstar 50k	Geophysica	l Logs tic Televie	wer		Water Level	
Drilling Method Air-rotary Hammer	Calipe		WCI		Total Depth 1260 feet	
Description	Depth (ft) Drill Rate (min/ft) Reaction to			HCl	Remarks	
SM, <u>Silty Sand</u> (0 - 70 feet)		- 0 -				
		- 20 - ·				
			0.35			
		- 40 -	1.7			
		- 60 -	0.3			
SP, Sand with Gravel (70 - 290 feet)		- 80 -	0.45			
		- 100 -	0.3			
		- 120 -	0.45			
		- 140 -	0.6	Strong		
		- 160 - 	0.55			
		- 180 - 	0.6			
		- 200 - 	0.65			
		- 220 -	0.65			
		- 240 -	0.4			
		- 260 - 	0.6			
		- 280 - 	0.65			



Project	Excelsior	Hole ID	NSH-021E	3		Location NSH-DB
	Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
			- 300 -	0.7		
			- 320 -	0.5		
			- 340 -	0.65		
			- 360 -	0.8	Weak	
			- 380 -	0.8		
			- 400 -	0.75		
			- 420 -	0.85		
			- 440 -	0.9		
			- 460 -	0.95		
			- 480 -	1		
			- 500 -			
			- 520 -			
			- 540 -	0.85		
Dolomite	ormation (550 – 650 feet) /limestone with green tactite and	d	- 560 -	1.35		
chrysoco	IIQ.		- 580 -	1.25		
			- 600 -	1.15	Strong	
			- 620 -	1.33		
			- 640 -	1.5		
				1.35		



Project Hole ID Location Excelsior NSH-021B NSH-DB Drill **Reaction to Depth Description** Remarks Rate **HCl** (ft) (min/ft) <u>Upper Abrigo Formation</u> (650 – 1030 feet) 660 Variably altered calc-silicates with green hornfels 1.3 and white tactite. Other minerals observed include rhodochrosite, copper oxides, and minor 680 amounts of iron oxide. 1.15 700 2.9 720 3.3 740 1.25 760 1.5 780 1.6 800 1.25 820 Weak 1.3 to 840 strong 1.25 860 1.3 880 1.05 900 1.15 920 1.15 940 1.15 960 1.5 980 1.45 1000 1.6



Project Excelsior	Hole ID	NSH-021B			Location NSH-DB
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
Middle Abrigo Formation (1030 – 1260) Predominately consists of dark brown-c garnetite with copper oxides and iron oxides are oxides and iron oxides and iron oxides and iron oxides are oxides and iron oxides and iron oxides are oxides and iron oxides are oxides and iron oxides and iron oxides are oxides and iron oxides are oxides and iron oxides and iron oxides are oxides and iron oxides are oxides and iron oxi	olored	- 1020 1040 1060 1080 1100 1120 1140 1160 1220 1240 1260 -	1.25 1.5 1.1 1 1.2 9.25 15.5 19 16.4 15.1 16.8		



BORING LOG Page <u>1</u> of <u>5</u>

Project Excelsior	Hole ID NSH-021C				Location NSH-DB	
Project Number 38361	Lithology Described by K, Ford				Date Started 1/9/15	Date Finished 1/13/15
Drilling Company National EWP	Geophysical Logging Co. COLOG				Site Elevation	,
Drilling Equipment Speedstar 50k	Geophysica	l Logs stic Televie		nok	Water Level	
Drilling Method Air-rotary Hammer	Calipe		WCI		Total Depth 1400 feet	
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Ren	narks
approximately 15% gravel, 10% fines, a sand. Sand and gravel are white and lig dark grey; fines are medium brown. Graconsist of quartz monzonite; light green orange-brown limestone; grey limestone	ell graded sand with silt (SW-SM). Consists of opproximately 15% gravel, 10% fines, and 75% and. Sand and gravel are white and light to ark grey; fines are medium brown. Gravels onsist of quartz monzonite; light green tactite;			Mod - Strong	Dry drilling for BHA 20" hole opener 0- 13" hammer 20-62 7 7/8" hammer 620 7 7/8" tricone 1160	20 ft. 0 ft. )-1160 ft.
yellow/orange/grey dolomite. Sand cons quartz, plagioclase, magnetite, limeston dolomite, and tactite. Angular to sub-rou	e,	 - 60 -	0.30			
80% granitic, 20% lithic.		 - 80 -	0.55			
Mixed Lithic Alluvium (50-290 feet) Poorly graded sand with gravel (SP). Consists of approximately 25% gravel, <5% fines, and 70% sand. Fines are white and light to dark grey; pale orange-brown. Gravels consist of mixed lithics including quartz monzonite; limestone; dolomite; garnetite; magnetite; hornfels; and tactite.		100 120 -	0.60		Fines washed out during drilling.	during drilling.
Angular to sub-rounded. 60% granitic, 4		- 140 -  - 160 -	0.50			
		 - 180 -		Mod - Strong		
			0.60	-		
			0.80			
		- 220 - 	1.00			
		- 240 - 	0.60			
		- 260 - 	0.70			
		- 280 - 	0.65			



Project Excelsior	Hole ID	NSH-0210	;		Location NSH-DB		
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks		
		- 300 - 	0.80				
Granitic Alluvium (290 - 540 feet)			- 320 - 	0.75			
Poorly graded sand with gravel (SP). Approximately 15% gravel, <5% fines, 8 Greater than 90% granitic with the rem	aining	- 340 -	1.00				
10% lithics. Granitic material predomina light grey, pale yellow/orange. Lithics co quartz monzonite, plagioclase, minor ta	nsist of ctite,	- 360 - 	0.65	Weak			
limestone, dolomite, magnetite, and hor Sub angular to rounded. Subangular to subrounded. Max gravel size is approxi		- 380 -	0.85				
mm.		- 400 - 	0.85				
		- 420 - 	0.65				
		- 440 - 	0.75				
		- 460 - 	0.95				
				- 480 - 	0.65		
		- 500 - 	0.55				
		- 520 - 	0.70				
Martin Formation (540-620 feet)		- 540 - 	0.90		Installed 8 inch casing from 0 to		
Variably altered carbonates. Colors include reddish/purple brown, light green, and white. Highly mineralized zones Chrysocolla between 590 and 620 feet.	hite.	- 560 - 	1.00	Weak	620 ft bgs.		
		- 580 -	1.10				
		- 600 -	0.90				
Martin Formation/Upper Abrigo Transition 640 feet)	on (620-	- 620 -	0.80		Possible gradational contact. Started drilling with 7 7/8" hammer.		
		- 640 -	1.10				



Project Hole ID Location Excelsior NSH-021C NSH-DB Drill Reaction to **Depth** Description Remarks Rate **HCl** (ft) (min/ft) 660 <u>Upper Abrigo Formation</u> (640-1020 feet) 1.25 Sandy dolomite. Color ranges from light green to 680 greenish grey. Highly mineralized zones of Weak Chrysocolla between 640-670 feet and 750-830 1.35 feet. 700 1.35 720 1.85 740 0.90 760 1.80 780 1.15 800 1.85 820 1.20 840 1.65 860 1.75 880 1.25 900 1.65 920 1.25 940 1.80 960 1.20 980 1.75 1000 2.10



Project Excelsior	Hole ID	NSH-0210	2		Location NSH-DB		
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks		
Middle Abrigo Formation (1020-1250 feet)		- 1020 -	2.85	Week			
Brown garnetite with zones of variable a to black lithics. Copper mineralization is with zones observed between 1070-108	ite with zones of variable alteration s. Copper mineralization is variable oserved between 1070-1080 feet	etite with zones of variable alteration cs. Copper mineralization is variable	e alteration n is variable	- 1040 -	1.80	Weak	
and 1140-1150 feet. Minor white marble		- 1060 -					
		- 1080 -  - 1100 -	1.10				
		- 1120 -	2.30				
		- 1140 -					
		- 1160 -					
		1180 -					
		- 1200 -	4.55				
		- 1220 - 	0.00				
		- 1240 -	1.30				
Lower Abrigo Formation (1250-1370 fee Dark green altered calc-silicates. Minor carbonates.		- 1260	0.90				
Carbonaco.		- 1280 1300	0.80				
		- 1320 -	1.52				
		- 1340 -	3.36				
		- 1360 -					
		-	2.54				



BORING LOG Page <u>5</u> of <u>5</u>

Project Hole ID Location Excelsior NSH-021C NSH-DB Drill Reaction to Depth Description Remarks Rate HCl (ft) (min/ft) <u>Iron oxide/carbonate lense</u> (1370-1400 feet) - 1380 Interval of iron oxide between 1370 and 1380 Total depth of boring is 1400 feet. 4.40 feet. Tan carbonate with minor oxides and dark 1400 green minerals.



Project Excelsior	Hole ID	NSH-022			Location NSH-BF		
Project Number 38361	Lithology Described by C. Price, J. Cook			ok	Date Started 12/20/14	Date Finished 1/19/14	
Drilling Company National EWP	Geophysical Logging Co. COLOG				Site Elevation		
Drilling Equipment Schramm 685	Geophysical Logs Acoustic Televiewer				Water Level		
Drilling Method Air-rotary Hammer	Calipe	er, Electrica al Gamma	al Resis	tivity,	Total Depth 1170 feet		
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks		
Mixed Lithic Alluvium (0-320 feet) Primarily sand with gravel (GW). Appro 50% granitic and 50% other lithics (limedolomite). Sub angular to sub rounded.	stone &	- 0	1.10 0.70 0.90 0.65 0.30 0.45 0.40 0.25 0.25	Strong	Dry drilling for BHA 20" hole opener 0-1 12" hammer 20-64 11 5/8" tricone 645	20 ft. 5 ft.	



Project Excelsior	Hole ID	NSH-022			Location	NSH-BF																								
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl		Rema	rks																							
Mixed Lithic Alluvium (0-320 feet)		- 300 -	.55																											
		- 320 -	.55																											
Granitic Alluvium (320 - 600 feet)			0.55																											
Primarily sand with gravel (GW). Greate 90% granitic with the remaining 10% macarbonates. Tan to off-white. Subangula	ade up of	- 340 - 	0.50																											
subrounded.		- 360 -		Weak																										
		- 380 -	0.50																											
			0.60																											
		- 400 -	0.75																											
		- 420 -	0.75																											
			0.65																											
		- 440 -	0.55																											
		- 460 -																												
		480 -	0.50																											
																										0.55				
		- 500 -																												
		 - 520 -	0.55																											
			1.85																											
		- 540 -																												
		- 560 -	1.00																											
			1.60																											
		- 580 -	1.45																											
		- 600 -	1.40																											
Escabrosa Formation (600-720 feet) Primarily a coarse grained granular mar	ble.	- 620 -	2.45	Medium to																										
White in color with zones of iron oxide a reddish banding. Subangular to subrour	hite in color with zones of iron oxide and dark		4.85	strong																										
		- 640 -	7.00																											



Project Excelsior	Hole ID	NSH-022			Location NSH-BF												
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks												
Escabrosa Formation (600-720 feet)		- 660 -	17.8														
			6.7														
		- 680 -	0.05														
		- 700 -	8.65														
			12.4														
		- 720 -															
			10.5														
Martin Formation (720-1000 feet) Variably altered carbonates. Abundant i		- 740 -	15.5														
oxides throughout. Color ranges from v brown, and dark grey. Highly mineralize	vhite, d zones	- 760 -	13.3														
Chrysocolla between 730-770 feet and 9 feet.	930-960		17.9														
reet.		- 780 -		Strong													
			13.3														
														- 800 -	18.4		
		- 820 -															
			32.0														
		- 840 -															
		- 860 -	14.6														
		- 000 -	14.5														
		- 880 -															
			7.5														
		- 900 -															
		- 920 - 															
		- 960 -															
		- 980 -															
		- 1000 -															
			3.55														



Project Hole ID Location Excelsior NSH-022 NSH-BF Drill Reaction to **Depth** Description Remarks Rate **HCl** (ft) (min/ft) - 1020 Abrigo Formation (1000-1170 feet) 8.75 Variably altered carbonates. Color ranges from Weak 1040 dark grey to dark grey. Zones of light colored carbonates throughout. Abundant micaceous 8.85 minerals in upper section. 1060 -7.4 1080 -48.1 - 1100 -25.3 - 1120 29.9 - 1140 -19.5 - 1160 -Total depth of boring is 1170 feet. 12.5 1170 -



BORING LOG Page <u>1</u> of <u>5</u>

Project Excelsior	Hole ID	NSH-023			Location NSH-DI	D	
Project Number 38361	Lithology I	Described by J, Coo			Date Started 1/14/15	Date Finished 1/17/15	
Drilling Company National EWP	Geophysical Logging Co. COLOG			LOG	Site Elevation		
Drilling Equipment Speedstar 50k	Geophysica	l Logs ical Resisti	ivity Ac	oustic	Water Level		
Drilling Method Air-rotary Hammer	Televi	ewer, Soner, Gamma	ic, Neut	ron,	Total Depth 1440 feet		
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks		
Mixed Lithic Alluvium (0-420 feet) Approximately 50% granitic and 50% lith Granitics are tan to light brown. Lithics a comprised of carbonates and are mostly brown in color.	are	- 0 - 20 - 2 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3	0.50 0.45 0.35 0.40 0.55 0.55 0.55 0.55 0.55	Strong	Dry drilling for BHA 20" hole opener 0- 13" hammer 20-64 7 7/8" hammer 645	20 ft. ·5 ft.	



Project Excelsior	Hole ID	NSH-023			Location NSH-DD
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
	Mixed Lithic Alluvium (0-420 feet) Approximately 50% granitic and 50% lithics. Granitics are tan to light brown. Lithics are comprised of carbonates and are mostly green to brown in color.		0.55	Strong	
comprised of carbonates and are most			0.50		
			0.65		
		- 360 -	0.50		
		- 380 -	0.55		
		- 400 -	0.60		
Granitic Alluvium (420 - 620 feet)	Granitic Alluvium (420 - 620 feet)		0.60		
Greater than 90% granitic with the rema comprised of 10% lithics. Granitic mater predominantly tan to light brown; bitotite	ial	- 440 -	0.70	Weak	
common. Lithics consist of carbonates.		- 460 -	0.70		
		- 480 -	0.55		
		- 500 -	0.55		
		- 520 -	0.60		
		- 540 -	0.75		
		- 560 -	0.55		
		- 580 -	0.60		
		- 600 -	0.60		
Martin Formation (620-850 feet)		- 620 - 620 - 640	1.15		
		- 040 -	0.75		



Project Excelsior	Hole ID	NSH-023			Location NSH-DD
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
Martin Formation (620-850 feet) Variably altered carbonates. Colors included	artin Formation (620-850 feet) ariably altered carbonates. Colors include own to light grey. Copper oxide observed from 10-620 feet; 720-740 feet; at 780 feet; and 820- 10 feet.		0.70	Strong	
brown to light grey. Copper oxide observes 590-620 feet; 720-740 feet; at 780 feet;			1.10		
040 leet.					
		- 720 -	1.50		
		- 740 -	1.10		
		- 760 -	1.20		
		- 780 -	1.30		
		- 800 -	1.35		
			1.40		
		- 820 -	1.65		
		- 840 -	1.95		
Upper Abrigo Formation (850-1190 feet) Dark to light green tactite. Abundant iro present. Minor amounts of copper oxide	n oxides	- 860	1.05		
present. Minor amounts of copper oxide observed. Sicliceous zone between 115 1160.	0 and	- 880 -	1.30		
		- 900 -	1.15		
		- 920 -			
		_ 940 _	1.70		
		- 960 -	1.55		
		- 980 -	1.35		
		- 1000 -	2.35		
			2.15		



Project Excelsior	Hole ID	NSH-023			Location	NSH-DD					
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl		Rema	rks				
Upper Abrigo Formation (850-1190 feet		- 1020 -									
Dark to light green tactite. Abundant iro oxides present. Minor amounts of copp			2.10								
oxides observed. Sicliceous zone between					- 1040 -						
1150 and 1160.			1.45								
		- 1060 -									
			2.15								
		- 1080 -									
			1.75								
		- 1100 -	2.20								
		- 1120 -	2.20								
		- 1120	3.10								
		- 1140 -	0.10								
			2.25								
		- 1160									
			2.60								
		- 1180 -									
			2.60								
Middle Abrigo Formation (1190-1260 fee		- 1200 -									
Brown garnetite with zones of variable a to black lithics which include pyrite and s	Iteration sulfides.		3.20								
Gold an blueish purple sulfides between		- 1220 -									
and 1240 feet.			1.85								
		- 1240 -									
			2.00								
		- 1260									
Lower Abrigo Formation (1260-1440 fee	et)		2.95								
Dark green altered calc-silicates. Dark of hornfels, sulfides, pyrite, and chalcopyri		- 1280	2.45								
part rich in black hornfels.		- 1300 -	2.15								
		- 1300 -	1.65								
		1320	1.00								
			2.25								
		- 1340 -									
			2.55								
						- 1360 -					
			3.25								



BORING LOG Page <u>5</u> of <u>5</u>

Project	Excelsior	Hole ID	NSH-023			Location NSH-DD
	Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
Dark gr	Dark green altered calc-silicates. Dark green		- 1380 -	3.00		
hornfels	s, sulfides, pyrite, and chalcopyr art rich in black hornfels	fides, pyrite, and chalcopyrite.				
			- 1420 -	3.10		
			- - 1440 -	3.80		Total depth of boring is 1440 feet.



BORING LOG Page <u>1</u> of <u>5</u>

Project Number 38361 Litholog		ΟV		Date Started	Location NSH-DC		
		Lithology Described by J, Cook			Date Finished 1/22/15		
Drilling Company National EWP Geophy	Geophysical Logging Co.			1/18/15 Site Elevation			
I Spoodstar bok	Geophysical Logs			Water Level			
Drilling Method Air rotory Hammer Te	Electrical Resistivity, Acoustic Televiewer, Sonic, Caliper Natural Gamma			Total Depth 1440 feet			
Description	Depth (ft) Drill Rate (min/ft) Reaction to		Remarks				
Mixed Lithic Alluvium (0-380 feet) Well graded sand with silt (SW-SM). Consists of approximately 15% gravel, 10% fines, and 75% sand. Sand and gravel are white and light to dark grey; fines are medium brown. Gravels consist of quartz monzonite; light green tactite; orange-brown limestone; grey limestone; yellow/orange/grey dolomite. Sand consists of quartz, plagioclase, magnetite, limestone, dolomite, and tactite. Angular to sub-rounded. 50% granitic, 50% lithic.	- 20 - 40 - 60 - 80 - 100 - 120 - 140 - 160 - 180 - 200 - 220 - 240 - 260	0.50 0.55 0.35 0.50 0.55 0.60 0.55 0.50	Strong	Dry drilling for BHA 20" hole opener 0-: 13" hammer 20-62 7 7/8" hammer 625	20 ft. 5 ft.		



Project Excelsior	Hole ID	NSH-024			Location	NSH-DC				
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl		Remarks				
Mixed Lithic Alluvium (0-380 feet)	<u>n (</u> 0-380 feet)		0.50							
			0.50							
			0.50							
			0.65							
		- 360 - 	0.55							
		- 380 -	0.60							
<u>Granitic Alluvium (</u> 380 - 600 feet) Poorly graded sand with gravel (SP).		- 400 -		Weak						
Approximately 15% gravel, <5% fines, 8 Greater than 90% granitic with the rema 10% lithics. Granitic material predomina	aining	420 -	0.50							
light grey, pale yellow/orange. Lithics colliquartz monzonite, plagioclase, minor tad	nsist of		0.60							
limestone, dolomite, magnetite, and hore Sub angular to rounded. Subangular to	r to	to	)	)		- 440 -	0.55			
subrounded. Max gravel size is approxir mm.					- 460 -	0.55				
		- 480 -								
		- 500 -	0.60							
		- 520 -	0.60							
		- 520 -	0.55							
		- 540 -	0.60							
		- 560 -								
			0.60							
			0.60							
Martin Formation (600-800 feet)	artin Formation (600-800 feet) Ariably altered carbonates. Color is Bedominantly light green and brown. Highly Ariable cones between 640-660 feet; 690-		0.65							
predominantly light green and brown. Hi			1.55							
720; 770-800.	-,	- 640 -								
			1.85							



Project Excelsior	Hole ID	NSH-024			Location NSH-DC
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
Martin Formation (600-800 feet)		- 660 -			
			1.80		
		- 680 -			
		700	1.30		
		- 700 -	1.40		
		- 720 -			
			0.90		
		- 740 -			
		700	1.35		
		- 760 -	1.10		
		- 780 -	1.10		
		- 800 -	1.10		
		- 000 -	4.00		
		- 820 -	1.30		
			1.55		
<u>Upper Abrigo Formation</u> (800-1100 feet Green tactite with variable zones of iron	) oxide.	- 840 -			
Color ranges from light green to greenis	sh grey.				
Highly mineralized zones of Chrysocolla 850-860 feet; 890-900; and 1020-1030 feet;		- 860 -			
magnesium oxide at 1010-1040.			0.90		
		- 880 -			
		- 900 -			
		- 920 -			
		- 940 -			
		- 960 -			
		- 980 -			
		- 1000 -			



Project Excelsior	Hole ID	NSH-024			Location	NSH-DC
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl		Remarks
<u>Upper Abrigo Formation</u> (800-1100 feet)	Jpper Abrigo Formation (800-1100 feet)		2.55			
		- 1040 -	2.00			
		- 1060 -	1.95			
		- 1060 -	2.95			
		- 1080 -	2.10			
		- 1100 -	2.10			
Middle Abrigo Formation (1100-1270 fee	<b>24)</b>	- 1120 -	2.35			
Largely a brown garnetite oxide zone. S interval from 1200-1250 feet. Copper ox	iliceous	- 1120 -	1.5			
mineralization observed at 1160; 1220-1 1260 feet.		- 1140 -	2.75			
		- 1160 -	2.73			
			2.10			
		- 1180 -	2.75			
		- 1200 -	2.95			
		1220				
		- 1240 - ·	3.10			
			1.15			
		- 1260	1.65			
Lower Abrigo Formation (1270-1445 fee	+\	- 1280				
Dark green to black hornfels, sulfide mineralization (pyrite and chalcopyrite)	i)		1.60			
throughout. Siliceous zone from 1350-1	390.	_ 1320 _	2.60			
			3.35			
		- 1340 -				
			6.00			
			3.00			



BORING LOG Page <u>5</u> of <u>5</u>

Project	Excelsior	Hole ID	NSH-024			Location NSH-DC
	Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
Lower Ab	origo Formation (1270-1445 fe	et)	- 1380 -			
			1400			
			- 1400			
			- 1420			
				3.25		
			_ 1440 _			Total depth of boring is 1445 feet.
			-			



BORING LOG Page <u>1</u> of <u>5</u>

Project Excelsior	Hole ID	NSH-025			Location NSH-DI	D
Project Number 38361	Lithology Described by J, Cook				Date Started 1/19/15	Date Finished 1/26/15
Drilling Company National EWP	Geophysica			3	Site Elevation	
Drilling Equipment Schramm 685	Geophysica Flectr	ıl Logs ical Resisti	ivity Ac	oustic	Water Level	
Drilling Method Air-rotary Hammer	Televi	ewer, Son al Gamma			Total Depth 1596	S feet
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Ren	narks
Mixed Lithic Alluvium (0-310 feet) Approximately 50% granitic and 50% lith Granitics are tan to white with abundant Lithics are comprised of carbonates and green to brown in color.	quartz.	- 0 20 40 60 80 100 120 140 140 -	0.50 0.35 0.75 1.00 0.70 0.90	Strong	Dry drilling for BHA 20" hole opener 0- 10" hammer 20-15	20 ft.
		- 160 -  - 180 -	0.85			
		- 200 - 220 -	0.50			
			0.55			
		- 240 - 				
		- 260 -				
		 - 280 -				
			1.05			



Project Excelsior	Hole ID	NSH-025			Location	NSH-DP	
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl		Remarks	
		- 300 -	0.50				
Granitic Alluvium (310 - 600 feet)		- 320 -					
Greater than 90% granitic with the rema comprised of 10% lithics. Granitic mater			0.45				
predominantly tan to light brown; bitotite common. Lithics consist of carbonates.		- 340 -	0.65				
		- 360 -	0.90				
		- 380 -	0.00				
			0.55				
		- 400 -	0.35				
		- 420 -					
		- 440 -	0.65				
		- 440 -	0.55				
		- 460 -					
		- 480 -	0.40				
			0.75				
		- 500 -	0.70				
		- 520 -	0.70				
			0.85				
		- 540 -	0.85				
		- 560 -	0.65				
			0.95				
		- 580 -	0.50				
		- 600 -					
Martin Formation (600-830 feet) Variably altered carbonates. Color is			0.90				
predominantly light green and brown. Lo zones of white marble were encountered Copper oxide is present throughout; not	d.	- 620 -	0.70				
between 780 and 830 feet.	abiy	- 640 - 	1.10				



Project Excelsior	Hole ID	NSH-025			Location	NSH-DP	
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl		Remarks	
Martin Formation (600-830 feet)		- 660 -					
			1.05				
		- 680 -					
			0.85				
		- 700 -	0.70				
		- 720 -					
			1.15				
		- 740 -					
			1.45				
		- 760 -					
		700	1.70				
		- 780 -	4.05				
		- 800 -	1.25				
			1.75				
		- 820 -	1.73				
			2.05				
Upper Abrigo Formation (830-1150 feet)	١	- 840 -					
Green tactite with variable zones of iron	oxide.		2.81				
Color ranges from light green to greenis Variable amounts of amounts of iron oxi	h grey. ides.	- 860 -					
Minor copper oxides (which are less			1.50				
concentrated than the overlying Martin). poor throughout with one notable excep	tion	- 880 -	1.75				
between 1120 and 1130 feet.		- 900 -	1.75				
			2.20				
		- 920 -					
			2.35				
		- 940 -					
			2.45				
		- 960 -					
			2.70				
		- 980 -	0.07				
		- 1000 -	2.25				
			0.85				



Project Excelsior	Hole ID	NSH-025			Location	NSH-DP
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl		Remarks
Upper Abrigo Formation (830-1150 feet	)	- 1020 -				
			1.85			
		- 1040 -				
			1.30			
		- 1060 -	4.05			
		1000	1.65			
		- 1080 -	1.60			
		- 1100 -	1.60			
			1.50			
		- 1120 -				
			1.95			
		- 1140 -				
			2.35			
Middle Abrigo Formation (1150-1230 fee	<b>1</b> 1)	- 1160 -				
Largely a brown garnetite oxide zone. C	olor		1.40			
ranges include brown, red, green, and o Minor copper oxide mineralization obser		- 1180 -				
			1.55			
		- 1200 -	1.00			
			1.90			
		1220	2.00			
		- 1240 -				
			1.00			
Lower Abrigo Formation (1230-1590 fee Dark grey to green tactite. Upper section		- 1260				
between 1230 and 1290 is largely oxide	rich.		2.25			
The remaining unit between 1290 and 1 consists mainly of sulfide mineralization		- 1280				
common. A small granitic zone was en	countered		1.50			
was observed between 1560 and 1590.	between 1420 and 1460. Oxide rich material was observed between 1560 and 1590.					
			1.50			
		_ 1320 _	4 75			
		1040	1.75			
		- 1340 -	2.10			
		- 1360 -	2.10			
			2.40			



BORING LOG Page <u>5</u> of <u>5</u>

Project Excelsior	Hole ID	NSH-025			Location NSH-DP
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
Lower Abrigo Formation (1230-1590	ower Abrigo Formation (1230-1590 feet)		2.40		
		- 1400 <i>-</i>			
		- 1420 -			
		- 1440 -			
		- 1460 -			
		- - 1480 -			
		1500 -			
		 - 1520 -	1.85		
		- - 1540 -	2.85		
			2.95		
			4.00		
Bolsa Quartzite (1590-1596 feet)		- 1580 -	E 00		
Light colored quartzite (white to tan). with pyrite, chalcopyrite. Minor molyb copper oxide.	Sulfide rich denite and	- 1600 -			Total depth of boring is 1596 feet.
		- 1620 - 			



BORING LOG Page <u>1</u> of <u>3</u>

Project Excelsior	Hole ID	NSH-026			Location NSH-BE	
Project Number 38361	Lithology Described by J. Cook				Date Started 1/23/15	Date Finished 1/26/15
Drilling Company National EWP	Geophysical Logging Co.				Site Elevation	.,,,
Drilling Equipment Speedstar 50k	Geophysica	_	vity A o	ouetie	Water Level	
Drilling Method Air-rotary Hammer	Televi	ical Resisti ewer, Cali <sub>l</sub> al Gamma	per, Neu	utron	Total Depth 905	feet
	Ivature		Drill	Reaction to		
Description		Depth (ft)	Rate (min/ft)	HCl	Ren	narks
Mixed Lithic Alluvium (0-310 feet) Approximately 50% granitic and 50% litt Granitics are tan to white with abundant Lithics are comprised of carbonates and dark green to brown in color.	quartz.	- 0 200	0.45 0.45 0.60 0.55 0.70 0.70 0.60 0.85 0.75	Strong	Dry drilling for BHA 20" hole opener 0- 13" hammer 20-62 7 7/8" hammer 620	20 ft. 0 ft.
		- 280 -				
			0.70			



Project Excelsior	Hole ID	NSH-026			Location	NSH-BE	
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl		Remarks	
		- 300 -	0.70				
Granitic Alluvium (310 - 600 feet)		- 320 -					
Greater than 90% granitic with the rema comprised of 10% lithics. Granitic mater	rial	- 340 -	0.60	Strong			
predominantly tan to white. Lithics consi carbonates and are tan to white in color			0.75				
		- 360 - 	0.95				
		- 380 -					
		400	0.85				
		- 400 - 	1.35				
		- 420 -	0.00				
		- 440 -	0.60				
			1.00				
		- 460 - 	1.00				
		- 480 -					
		- 500 -	1.15				
			1.00				
		- 520 -	0.85				
		- 540 -	0.00				
			0.75				
		- 560 - 	0.65				
		- 580 -					
		- 600 -	0.80				
Escabrosa Limestone (600-700 feet) Mostly white granular marble. Locally, da	Escabrosa Limestone (600-700 feet)		1.30	Strong			
banding present. Grey limestone and iron present between 680 and 700 feet.	n oxide	- 620 - 	1.50				
F		- 640 -					
			1.10				



Project Excelsior	Hole ID	NSH-026			Location NSH-BE			
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks			
		- 660 -						
		- 680 -	1.20					
			0.90					
		- 700 -						
<u>Upper Abrigo Formation</u> (700-905 feet) Altered carbonates. Dark brown to gree	n ovide	- 720 -	1.15	Strong				
rich carbonates. Locally, there are light and brown bands of granular carbonate	er tan	- 720 - 	1.20	3				
oxide is present between 730-740 and 8 feet. Red-brown iron oxides present ne	310-830	- 740 -						
feet.	ai 300		1.30					
		- 700 -	1.80					
		- 780 -						
		- 800 -	2.15					
			1.55					
		- 820 -						
		- 840 -	1.55					
			1.20					
		- 860 -	4.00					
		- 880 -	1.60					
						1.60		Total depth of boring is 905 feet.
		- 900 -			Total depth of boning is 900 feet.			
		- 920 -						
		- 940 -						
		 - 960 -						
		- 980 -						
		- 1000 -						



Project Excelsior	Hole ID	NSH-027			Location NSH-BC	3	
Project Number 38361	Lithology Described by J, Cook				Date Started 1/26/15	Date Finished 2/1/15	
Drilling Company National EWP	Geophysical Logging Co.				Site Elevation	<u> </u>	
Drilling Equipment Schramm 685	Geophysica	ıl Logs ical Resist	ivity Ac	ouetic	Water Level		
Drilling Method Air-rotary Hammer	Televi	iewer, Cali <sub>l</sub> al Gamma	per	oustic	Total Depth 1022	? feet	
Description		Depth	Drill Rate (min/ft)	Reaction to HCl	Remarks		
Mixed Lithic Alluvium (0-310 feet) Approximately 50% granitic and 50% lit Granitics are tan to white with abundan	t quartz.	- 0 -  - 20 -	2.20		Dry drilling for BHA 20" hole opener 0- 12 3/8" hammer 20	20 ft.	
Lithics are comprised of carbonates an dark green, brown, and orange in color			0.75	Strong	0,0		
			0.75				
		- 60 -	1.50				
		- 80 -	0.40				
		_ 100 _	0.40				
		- 120 -	0.40				
		- 140 -	0.45				
		- 160 -	0.35				
		- 180 -					
		- 200 -	0.50				
		- 220 -	0.40				
		- 240 -	0.65				
		- 260 -	0.55				
		- 280 - - 2					



Project Excelsior	Hole ID	NSH-027			Location NSH-BG
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
		- 300 -	1.05		
Granitic Alluvium (310 - 490 feet) Greater than 90% granitic with the rema	inina	- 320 -	0.65	Weak	
10% comprised of lithics. Granitic mater predominantly tan to white. Lithics consicarbonates and are tan to white in color	rial ist of	- 340 -	0.65	. VV Call	
		- 360 -	0.65		
		- 380 -	0.55		
		- 400 -	0.75		
		- 420 -	0.50		
		- 440 -	0.75		
		- 460 -	0.50		
		- 480 -	0.75		
Martin Formation (490-810 feet) Primarily brown to dark brown altered		- 500 -	1.25	Strong	
carbonates. Minor copper oxides betwe and 790 feet.	en 780	- 520 -	1.00		
		- 540 -	1.45		
		- 560 -	1.50		
		- 580 -	1.35		
		- 600 -	1.25		
		- 620 -	1.45		
		- 640 - 	1.10		



Project Excelsior	Hole ID	NSH-027			Location	NSH-BG	
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl		Remarks	
Martin Formation (490-810 feet)		- 660 -	1.60				
		- 680 -	1.00				
		- 700 -	1.15				
		- 720 - 	1.10				
		- 740 -	1.25				
		- 760 -	1.50				
		- 780 -	1.05				
		- 800 -	1.50				
<u>Upper Abrigo Formation</u> (810-1022 feet) Altered carbonates. Primarily pale greer	) n to dark	- 820 -	1.35	Strong			
green. Increased copper oxidizes betwee and 1000 feet. Large zone of iron oxide to 990 feet.	en 920	- 840 -	0.75	Ĵ			
		- 860 -	1.20				
		- 880 -	1.30				
		- 900 -	1.95				
	- 920 - 						
		- 940 -					
		- 960 - 	3.30				
		- 980 - 	3.00				
		- 1000 - 	1.85				



Project Excelsior	Hole ID	NSH-027			Location NSH-BG
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
		- 1020 -	4.14		Total depth of boring is 1022 feet.
		- 1040 -			
		- 1060 -			
		- 1080 -			
		- 1100 -			
		- 1120			
		- 1140			
		- 1160 -			
		- 1180 -			
		- 1200 -			
		- 1220			
		- 1240 -			
		- 1260			
		- 1280 - 1			
		- 1300 			
		_ 1320 _			
		- 1340 			
		- 1360 - ·			



BORING LOG Page <u>1</u> of <u>3</u>

Project Excelsior	Hole ID	NSH-028			Location NSH-BI	H	
Project Number 38361	Lithology I	Lithology Described by J, Cook			Date Started 1/27/15	Date Finished 1/29/15	
Drilling Company National EWP	Geophysica	Geophysical Logging Co.			Site Elevation	1,29,10	
Drilling Equipment Speedstar 50k	Geophysica	_	onoo A	oouetie	Water Level		
Drilling Method Air-rotary Hammer	Telev	ical Resist iewer, Cali na, Neutro	per,Natu	ural	Total Depth 800 feet		
	Gailli		Drill	Reaction to			
Description		Depth (ft)	Rate (min/ft)	HCl	Ren	narks	
Mixed Lithic Alluvium (0-300 feet) Approximately 50% granitic and 50% li Granitics are tan to white with abundar Lithics are comprised of carbonates ar ranges from dark brown to reddish bro	nt quartz. nd color	- 0 20 40 60 80 100 120 120 140 160 180 200 220 240 240 280 280 280 -	0.40 0.90 0.40 0.40 0.45 050 0.50 0.50 0.50	Strong	Dry drilling for BHA 20" hole opener 0- 13" hammer 20-54 7 7/8" hammer 540	20 ft. 0 ft.	



Project Excelsior	Hole ID	NSH-028			Location NSH-BH
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
Granitic Alluvium (300 - 500 feet)		- 300 -	0.45		
Greater than 90% granitic with the rema comprised of 10% lithics. Granitic mater predominantly tan to white and consist of	rial	- 320 -	0.55	Weak	
and feldspar. Lithics are comprised of carbonates and biotite.		- 340 -	0.80		
		- 360 -	0.70		
		- 380 -	0.75		
		- 400 -  - 420 -	0.90		
		- 440 -	0.75		
		- 460 -	0.80		
		- 480 -	0.70		
		- 500 -	0.75		
No Sample (500-530 feet)		- 520 -	1.50		495'-535'-Lost circulation
Martin Formation (530-790 feet)		- 540 -	1.70		
Dark colored altered carbonates. Zones of tan dolomite. Copper oxides are found throughout. Iron oxides present between and 780 feet.	-	- 560 -	1.30	Weak	
		- 580 -	0.60		
		- 600 - 	1.20		
		- 620 - 	1.15		
		- 640 - 	1.05		



Project Excelsior	Hole ID	NSH-028			Location NSH-BH
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
Martin Formation (530-790 feet)		- 660 -			
			0.85		
		- 680 -	1.10		
		- 700 -	1.10		
			1.70		
		- 720 -			
			1.15		
		- 740 -			
		700	1.15		
		- 760 -	1.15		
		- 780 -	1.10		
			1.80		
<u>Upper Abrigo Formation</u> (790-800 feet) Altered carbonates. Light to dark green	tactite /	- 800 -		None	Total depth of boring is 800 feet.
Minor copper and iron oxides.	tactile.				
		- 820 -			
		- 840 -			
		- 860 -			
		- 880 -			
		- 900 -			
		- 920 -			
		- 920			
		- 940 -			
		- 960 -			
		- 980 -			
		- 1000 -			
		- 1000			



BORING LOG Page <u>1</u> of <u>3</u>

Project Excelsior	Hole ID NSH-029	Location NSH-DR		
Project Number 38361	Lithology Described by M. Rex	Date Started Date Finished 1/28/15 1/29/15		
Drilling Company BJ Drilling	Geophysical Logging Co.	Site Elevation		
Drilling Equipment	Geophysical Logs	Water Level		
Drilling Method Air-rotary Hammer		Total Depth 710 feet		

Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
Mixed Lithic Alluvium (0-290 feet) Approximately 50% granitic and 50% lithics.		- 0 -			Dry drilling for BHA
Granitics are tan to white with abundant quartz.  Lithics are comprised of carbonates and color	t quartz.	- 20 -	1.00		11" hole opener 0-20 ft. 6 1/2" hammer 20-710 ft.
ranges from dark brown to reddish brown. Angular to subangular.			0.50	None	
		- 40 <i>-</i>	0.55		
		- 60 -	0.75		
		- 80 -	0.75		
		 - 100 -	0.75		
		- 100 -	0.60		
		- 120 -	0.60		
		- 140 -	0.00		
		 - 160 -	0.55		
			0.55		
		- 180 <i>-</i>	0.70		
		- 200 -	0.70		
			0.55		
		- 240 - 			
		- 260 -			
			0.75		



Project Excelsior	Hole ID	NSH-029			Location NSH-DR
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
Granitic Alluvium (290 - 500 feet) Greater than 90% granitic with the remaining comprised of 10% lithics. Granitic material		- 300 - 	0.70	None	
	dominantly tan to white and consist of quartz difference of the following terms of the desired of the following terms of the following te	- 320 -	0.80		
		- 340 -	0.70		
		- 360 -	0.85		
		- 380 -	0.75		
		- 400 -  - 420 -	0.65		
		440 -	0.60		
		- 460 -	0.65		
		480 -	0.70		
		500 -	0.70		
Martin Formation (500-710 feet) Altered carbonates. Intervals of marble, garnetite, and skarn. Colors include cre white, tan, and brown. Copper oxides be		- 520 -	1.05	Weak	
630 and 660 feet.	etween	- 540 -	1.30		
		- 560 -	1.50		
		- 580 - 	1.60		
		- 600 - 	1.55		
		- 620 -	1.25		
		- 640 - 	1.30		



Project Hole ID Location Excelsior NSH-029 NSH-DR Drill **Reaction to Depth** Description Remarks Rate **HCl** (ft) (min/ft) 660 Martin Formation (500-710 feet) Altered carbonates. Intervals of marble, 1.45 garnetite, and skarn. Colors include creamy 680 white, tan, and brown. Copper oxides between 630 and 660 feet. 1.75 700 Total depth of boring is 710 feet. 1.50 720 740 760 780 800 820 840 860 880 900 920 940 960 980 1000



BORING LOG Page <u>1</u> of <u>3</u>

Project Excelsior	Hole ID NSH-030	Location NSH-DQ		
Project Number 38361	Lithology Described by M, Rex	Date Started Date Finished 2/3/15		
Drilling Company BJ Drilling	Geophysical Logging Co.	Site Elevation		
Drilling Equipment	Geophysical Logs	Water Level		
Drilling Method Air-rotary Hammer		Total Depth 740 feet		

Air-rotary Hammer				740 feet
Description	Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
Mixed Lithic Alluvium (0-330 feet)	- 0 -			Dry drilling for BHA
Fine grained sandy gravel with clay. Approximately 50% granitic and 50% litl		0.25		11" hole opener 0-20 ft.
Granitics are tan to white with abundant Lithics are comprised of carbonates and	- 20 -	0.40	Slight	6 1/2" hammer 20-740 ft.
ranges from dark brown to reddish brow Angular to subangular.	- 40 -	0.40		
Angular to Subangular.		0.45		
	- 60 -			
		0.45		
	- 80 -	0.45		
	- 100 -	0.43		
		0.50		
	- 120 -			
		0.55		
	- 140 -	0.50		
	- 160 -	0.00		
		0.50		
	- 180 -			
		0.55		
	- 200 -	0.60		
	- 220 -	0.00		
		0.75		
	- 240 -			
	- 260 -			
	- - 280 -			
	 	0.60		



BORING LOG Page 2 of 3

Project Excelsior	Hole ID	NSH-030			Location	NSH-DQ	
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl		Rema	rks
Mixed Lithic Alluvium (0-330 feet)		- 300 -	0.50				
		- 320 -	0.00				
			1.30				
Horquilla Formation (330 - 420 feet) Fine grained limestone/marble. Sub and		- 340 -	3.30	Strong			
Creamy white in color. Garnetite bed be 370 and 400 feet.	etween	- 360 -		Ottorig			
		- 380 -	2.40				
			1.60				
		- 400 -	1.30				
		- 420 -					
Black Prince Limestone (420 - 560 feet) Fine to medium grained limestone. Gree brown, and black in color. Angular to subsect the subsect of t		- 440 -	1.70	Strong			
angular. Trace amounts of chrysocolla a feet.							
100.1		- 460 - 	1.25				
		- 480 -	4.55				
		- 500 -	1.55				
			1.25				
		- 520 <i>-</i>	1.90				
		- 540 -					
		- 560 -	1.75				
Escabrosa Limestone (560 - 740 feet) Fine grained limestone/marble. Creamy	v white in		1.40	Strong			
color. Angular to subangular.	,	- 580 - 	0.75				
		- 600 -					
		- 620 -	3.50				
			1.50				
		- 640 - 	1.20				



BORING LOG Page 3 of 3

Project Excelsior	Hole ID	NSH-030			Location NSH-DQ
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
Escabrosa Limestone (560 - 740	feet)	- 660 -			
		- 680 -	1.10		
			2.05		
		- 700 - 	1.45	•	
		- 720 -			
		740 -	1.35		Total depth of boring is 740 feet.
		- 760 -			
		- 780 -			
		- 800 -			
		- 820 -			
		- 840 -			
		- 860 -			
		- 880 -			
		- 900 - 			
		- 920 -			
		- 940 -			
		 - 960 -			
		- 980 -			
		- 1000 - 			



BORING LOG Page <u>1</u> of <u>3</u>

Project Excelsior	Hole ID NSH-031	Location NSH-DS
Project Number 38361	Lithology Described by M, Rex	Date Started Date Finished 2/3/15
Drilling Company BJ Drilling	Geophysical Logging Co.	Site Elevation
Drilling Equipment	Geophysical Logs	Water Level
Drilling Method Air-rotary Hammer		Total Depth 820 feet

All-Totaly Hallillel					020 1661
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
Mixed Lithic Alluvium (0-320 feet) Fine grained sandy gravel with clay. Approximately 50% granitic and 50% lith		- 0 - 20 -	1.00		Dry drilling for BHA 11" hole opener 0-20 ft. 6 1/2" hammer 20-820 ft.
Granitics are tan to white with abundant Lithics are comprised of carbonates and ranges from dark brown to reddish brow	d color	- 20 - 	0.20	None- Slight	0 1/2 Hammor 20 020 H.
Angular to subangular.			0.20		
		- 60 - 	0.50		
		- 80 -  - 100 -	0.40		
		- 120 -	0.30		
		- 140 -	0.35		
		 - 160 -	0.30		
		 - 180 -	0.30		
		- 200 -	0.35		
		- 220 -	0.35		
		- 240 -			
		260 -			
		- 280 -	0.30		
			0.33		



BORING LOG Page 2 of 3

Project Excelsior	Hole ID	NSH-031			Location	NSH-DS
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl		Remarks
		- 300 -	0.40			
		- 320 -	0.40			
Granitic Alluvium (320 - 420 feet) Greater than 90% granitic with the rema	inina		0.30			
comprised of 10% lithics. Granitic mater predominantly tan to white and consist of	rial	- 340 -				
and feldspar. Lithics are comprised of carbonates. Angular to sub angular.	, qua. 12	- 360 -	0.35	None		
carsonates. 7 mganar to ous angulari			0.30			
		- 380 -	0.55			
		- 400 -	0.55			
			0.65			
M ( 5 (100 000 ( ))		- 420 -	0.00			
Martin Formation (420 - 620 feet) Fine to medium grained marble and garr		- 440 -	0.90	Mod-		
Cream to light brown in color. Angular to angular.	SUD		0.90	Strong		
		- 460 -	0.00			
		- 480 -	0.90			
			0.85			
		- 500 -	1.00			
		- 520 -	1.00			
			0.95			
		- 540 -	1 10			
		- 560 -	1.10			
			0.90			
		- 580 -	1.05			
		- 600 -	1.05			
			0.85			
Fault Zone? (620 - 640 feet)	• . •	- 620 -	0.75			
Fine sand with high amounts of iron sta	ining.	- 640 -	0.75			
<u>Upper Abrigo Formation</u> (620 - 820 fee	et)		0.90			



BORING LOG Page 3 of 3

Project Excelsior	Hole ID	NSH-031			Location NSH-DS
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
Upper Abrigo Formation (620 - 820 feet Altered carbonates. Fine grained fragme Green, tan, and brown in color. Angular	ents.	- 660 - 6 680 - 6	0.90	Strong	
angular. Trace chrysocolla.		- 700 -	1.85		
		- 720 - 	1.25		
		- 740 760	1.40		740 – 760 feet; Possible fault zone.
		- 780 -	1.45		
		- 800 -	1.20		Total depth of boring is 820 feet.
		- 820			Total dopul of bolling to 020 foot.
		- 860 -			
		- 880 -			
		- 900 920			
		 - 940			
		- 960 - ·			
		- 980  - 1000			



BORING LOG Page <u>1</u> of <u>3</u>

Project Excelsior	Hole ID NSH-032	Location NSH-DT
Project Number 38361	Lithology Described by M, Rex	Date Started Date Finished 2/6/15 2/8/15
Drilling Company BJ Drilling	Geophysical Logging Co.	Site Elevation
Drilling Equipment	Geophysical Logs	Water Level
Drilling Method Air-rotary Hammer		Total Depth 820 feet

Air-rotary Hammer					620 feet
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
Mixed Lithic Alluvium (0-320 feet) Fine grained sandy gravel with clay. Approximately 50% granitic and 50% lithi	ics.	- 0 -	1.00		Dry drilling for BHA 11" hole opener 0-20 ft. 6 1/2" hammer 20-820 ft.
Granitics are tan to white with abundant of Lithics are comprised of carbonates and ranges from dark brown to reddish brown	color n.	- 20 -  - 40 -	0.50	None- Slight	0 1/2 Hammer 20-020 It.
Angular to subangular.		- 60 -	0.25		
		 - 80 -	0.80		
		 - 100 -	0.65		
		 - 120 - 	0.50		
		- 140 - 	0.40		
		- 160 - 	0.35		
		- 180 -  - 200 -	0.40		
		 - 220 -	0.40		
		- 240 -			
		- 260 - - 2 -			
		- 280 - 			



BORING LOG Page 2 of 3

Project Excelsior	Hole ID	NSH-032			Location NSH-DT	
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks	
		- 300 -	0.40			
		- 320 -	0.40			
Granitic Alluvium (320 - 420 feet) Greater than 90% granitic with the rema	inina		0.40			
comprised of 10% lithics. Granitic mater predominantly tan to white and consist of	ial	- 340 -				
and feldspar. Lithics are comprised of carbonates. Angular to sub angular.		- 360 -	0.45	None		
and the same of th			0.50			
		- 380 -	0.25			
		- 400 -	0.35			
			0.50			
Martin Farmation (400, 000 fact)		- 420 -	0.50			
Martin Formation (420 - 620 feet) Fine to medium grained marble and garr		- 440 -	0.50	Mod-		
Cream to light brown in color. Angular to angular.	SUD		0.60	Strong		
		- 460 -	0.90			
		- 480 -	0.90			
			0.70			
		- 500 -	0.90			
		- 520 -	0.00			
			0.80			
		- 540 -	0.80			
		- 560 -	0.00			
			0.85			
		- 580 -	0.75			
		- 600 -	0.70			
			0.90			
Fault Zone? (620 - 640 feet) Fine sand with high amounts of iron stai	inina	- 620 - 	0.85			
This said with high amounts of holl sta	y.	- 640 -				
			0.80			



BORING LOG Page 3 of 3

Project Excelsior	Hole ID	NSH-032			Location NSH-DT
Description		Depth (ft)	Drill Rate (min/ft)	Reaction to HCl	Remarks
Abrigo Formation (620 - 820 feet) Altered carbonates. Fine grained fragme Green, tan, and brown in color. Angular angular. Trace chrysocolla.	ents. to sub	- 660 - · 680 - ·	1.05	Strong	
		- 700	1.45		
		- 740 - 760	<ul><li>2.40</li><li>1.85</li></ul>		
		- 760 - ·  - 780 - ·	1.55		
		- 800 820	1.80		Total depth of boring is 820 feet.
		- 840 860			
		- 880			
		- 920			
		- 960			
		- 980  - 1000			



### **APPENDIX B**

**Well Completion Field Forms** 



Staff. D. COOK, B. KIGNGNISERGER	15 feet  0,7% Ft³/L  orehole Diamete inche inche inche inche	Annular Material Description (including number of bags & bag weight and batch mix and density for slurry )	10.8 Tacka.		No 20x NO 40 Sand 2X SOLB Dags.	Sgullon Buckets of 4, x08 turng. XZ	Of count,			44 bass of coment it bag bentonixe -17	of cement, 1 bus	39 bugs of rement, I body sentonite, 22	lement, I bug wentonite -200	ment: L(86	Total Bags of Bentonite Gel:	Total Bags of Bentonite Chips:	Total Bags of Transition Sand: 4	Total Super Sacks of Filter Pack: $\sim ^{1200}/_{2000}$ $$ LRS.
	athole:	Bottom of Tremie (feet)	280	0440	440	07/1	02/2	024	270	340	340	340	340					
Project No.: 38681-203	Length of Rathole: Rat Hole Volume per foot: (interval) B	Tagged Depth (feet)	b9h	463	١	,	\	1	١	~230	ì	,	09~	) x 0.005454	Ž3	-	200	
Project No.:	epth: 469 feet  ar [d]: 8,625 inches  c/69  Annular Volume per Linear Foot:  78 Ft*/Ft 469 - c/69  438 Ft*/Ft 469 - 20  Ft*/Ft 469 - 20	Calculated Depth (feet)	b9h	9.194	460.4	457.2	325.4	38.8	154'd	54.6	-13.3	-97,2	1.181-		SURFACE			f3
	469' 8.625 Solume per Frift Frift Frift Frift	Total Vol. Installed (ft³)	21~	∑., ∞.,	15.8	0'/)-	129	(OC)	13,9	167.9	195,8	227.7	9.858	er linear foot	ELOW LAND	= 0.7 Ft³	100 lbs/Ft³	oack is 30 F
101	이 무를 이이 !!	Yolume Bag(s) or Batch (ft³)	4	2,8		7-1	-1	32.9	7.15	36.0	27.9	31.9	31.9	cubic feet pe	E FEET BE	tonite chips	ind gravel =	sk.) of filter
Exelsior Nou-	0 m	Weight of Sand Bag(s) (Ibs.)	3000		00		· .	-						Annular volume cubic feet per linear foot = ( $D^2 - d^2$	ALL DEPTHS ARE FEET BELOW LAND SURFAC	50 lbs bag of bentonite chips = 0.7 Ft3	Density of sand and gravel = 100 lbs/Ft³	Full super sack (sk.) of filter pack is 30 Ft3
Project:	Total Well/ Ca orehole D 12 12	o or ch	>	7	*	1	5	2	7	7	7	7	>	Ι'	ALL [	50 lb	Dens	Fulls
	<u> </u>	Super Sk. or Batch No.	-					7	M	2	<b>ν</b>	9		Notes:				

~200 and which 20x46 sad Staff. J. COOK, B. KIENENBERGER (including number of bags & bag weight N and batch mix and density for slurry Annular Material Description 1 beat on the bentonia e 1 1 bentonte 6055 tacha cenert bantonite of coment of count. Vir chet h1-22-01 52495 39 bags 5569 39 Dags 412 bays 545 901107 39 39 Depth (feet) Tremie (feet) Bottom of 280 280 Project No.: 38681-203 0 0 Dates: 10-21-14 m Tagged 54 RACE 23 Calculated -465.0 -526.5 P.845-432,8 Depth (feet) -616,8 -523 -530. Total Vol. installed 384.6 723,U 392.3 390,9 2'524 2915 355 Bag(s) or (ft³) Project: EXCELSIOP Volume 31.9 31.9 3329 31.9 34, Well ID: NSH-007 7 Weight of Sand (lbs.) 00 Sk. or Batch Notes: N 10 00 2 4

Mestly Se

### 8" CASING

PIPE TALLY Project Name .: EXCELSIOR 38681-205 Project.No.: -NSH-CP Well No .: NSH-007 10-18-14 - 10-19-14,10-11-14 Total Depth: 464 Pipe Talley for: INTERMEDIATE CASING Geologist: DAWE ANDERSEN Jason Cook 10-21 V gth Length [ Type of Connections: Welded 🗖 T+C 🗖 Flush Thread 📮 Other Length Σ Pipe Type Length Pipe Type Pipe Length Pipe (ft) V 19,99 20,00 INT. Casing INT lustra INStalled in Reverse order 40.03 20,03 40.03 20.04 20,03 60.06 19.99 60.02 Ч 80.09 70.05 80.11 70.07 5 5 3 20.0 100.11 19,94 100,00 70.0 20.07 120.11 120.15 140,22 140.12 7 20,01 20.07 8 160.22 8 19,09 160.11 20,00 9 19,98 180,20 9 130.11 20.0 200,25 200:11 10 20.05 io 20.0 11 20.02 220.13 11 20.07 220,32 19.98 20,01 240, 15 240.30 12 2004260,17 13 13 20.01 160.31 2004300.21 V 14 20.04 280.35 14 Ũ 15 200 300.35 20.02 320.22 10 20,13 320.48 16 20.01 340.23 340.6 20.12 18 20,12 360,72 13 9 9 20.15 380.87 20,00 380.27 401.01 20 20.01 400.28 20 20,14 20.04 420.32 2 20,15 21 421.16 20.03 440,35 20.12 27 441.28 20.04 460.54 461.43 23 SUMMARY OF TALLY 20.00 480,39 10-21-14 2-1 481.56 Total Length tallied: cut 12,56 Casing Stick-Up: 11.56 K Length of Casing Cut-Off: 70.13 481.56 469 24 Bottom of Well: CASING Screened Interval: STICLUP Total Screen in Hole: Notes: Installation order does Not Match laydown alea, some Constel was delivered 11 differences depth complete. well of 1/2 all Joins later duc to Joint. Lost 501 length correct Cutoff piece. Subtract from Need length lotul cut off when Removed on had Section 10-19-2014 #70 ent off and se welded. was was cut out , longths the iett

Change'd- will be used on a different

Page 1 of 2

# ANNULAR MATERIAL RECORD

Super Sk. or Batch No.	Project:  Well ID:  Total W Well/Ca  US  US  US  US  US  US  US  US  US  U	Project :	Pecs   Depth   Depth	840 41.5 41.5 Volume per Ft/Ft Ft/Ft/Ft/Ft/Ft/Ft/Ft/Ft/Ft/Ft/Ft/Ft/Ft/F	Project No.:   Project No.:   Bepth	38691-20년 10-28-1년 Length of Rathole: Rat Hole Volume F (interval) (interval) (feet) (feet) (7년,7 7년,7 7년,5 7년,7 7년,5 7년,5 7년,5 7년,5 7년,5 7년,5 7년,5 7년,5 7년,5 7년,5 7년,5 7년,5 7년,7 7년,5 7년,5 7년,5 7년,5 7년,5 7년,5 7년,5	g 7000000000000000000000000000000000000	Staff: Jasen Coolk, Daw Anderson, Bradon 120/14  7 feet Rat Hole Volume: 3.8 Ft <sup>2</sup> Borehole Diameter [D]: Annular Volume per Linear Foot: (interval) inches inches Ft <sup>2</sup> /Ft Ft <sup>2</sup> /Ft inches Ft <sup>2</sup> /Ft  Inches Ft <sup>2</sup> /Ft  Inches Ft <sup>2</sup> /Ft  Annular Material Description (including number of bags & bag weight and batch mix and density for slurry)  Vul'x ND.8 Towlar  Vul'x ND.8 Towl
12			23.5	1,491	27.5		760	11
Notes:	Annula ALL DE 50 lbs   Density Full su	Annular volume cub ALL DEPTHS ARE 50 lbs bag of bentol Density of sand and Full super sack (sk.	Annular volume cubic feet per linear foot = ALL DEPTHS ARE FEET BELOW LAND 50 lbs bag of bentonite chips = 0.7 Ft³ Density of sand and gravel = 100 lbs/Ft³ Full super sack (sk.) of filter pack is 30 Ft³	er linear foo ELOW LAN = 0.7 Ft³ 100 lbs/Ft³ cack is 30 F	SURFACE	× 0.005454		Total Bags of Cement:  Total Bags of Bentonite Gel: $0.01$ Total Bags of Transition Sand: $0.00$ Total Bags of Transition Sand: $0.00$ Total Super Sacks of Filter Pack: $0.00$

41-02-11 NO 575 E/1 1

Ock, Dane Anderson, Brandon K		Annular Material Description (including number of bags & bag weight and batch mix and density for slurry )	arife + 150 gallons of whe		/,	(1)	11	77	1,1	1)	1)	()	11	11	1)	1)	11	1	TO ~191 FEET (11-20-14)	DUITE CHIPS (68 5ES)	TACNA (173 5KS)		was Air litted out	of Tacna Remove is		
Staff: Seson	170/14		5x5016 laws of bonton 1/2		3	۲۱	1,1	10	١١	11	1.	11	11	11	11	1.7	11	),	GROUT SOTTLE	3/8-INCH BENTONITE CHIPS	1/4-12CHA No. 8		Installed Filterpack	The total volume of		
h 92-	=	Bottom of Tremie (feet	4 60 CD	MOD	340	340	300	300	300	300	300	300	300	280	280	280	280	280	}	)	١		WAS	7, 2)2		
h 92-18985	1102-82-01	Tagged Bottom of Depth (feet)	į	\	١	١	-	-	١	١	١	1	1	~	1	-	-	0			0		Filter ouch	1 (2	اد	
Project No.:	Dates:	Calculated Depth (feet)	437	393	338	282	228	(13	8,11	63	8	+47	7017	+157	712+	+267	1355	+377	161~	80	0		Much Ti	2692	thm 61 -	
		Total Vol. Installed (ft³)	187.6	1,115	234.6	258.1	281.6	305.1	9.825	352,1	375.6	349,1	9.27h	1.9hh		443.1	9.9)5	540.(		587.7	627.7		v oct		to 600 ~	
	18	Volume Bag(s) or (ft³)	23.5	23.5	23.5	23.5	27.5	73.5	27.5	2.7.5	273	23,5	23.5	233	23.6	23.5	23.5	27.5	Ĭ	47.6	40.0		t4 hh	bore hole	est, my ted t	
Excelsior	NSHOUS	Weight of Sand (lbs.)																			4000		About	0 f (	654	
Project :	Well ID:	<i>&gt;</i>	>	>	`~	<u></u>	>	>	>	>	>	>	>	>	>	>	>	>								
		Super Sk. or Batch	3	ڡ	7	B	5	9	=	7	2	고	元	=		3.	6	70		_	N		Notes:			·

### PIPE TALLY 4" CASING

Project Name.: Excelsion	Project No.: 38681-204
Well No.: NSHI-008	Date: 10-28-7014
Location: NSH-CQ	Pipe Talley for: Scien and casing
Total Depth: 900 + 101	Geologist: Jacob Coch

Type of Connections: Welded T+C Flush Thread Other

	Pipe	1	Length (ft)	Length ∑ (ft)	Pipe Type	Pipe	1	Length (ft)	Length Σ (ft)	Pipe Type	
Centralizer -		1	20,56	~	4" Slotted sween	31	V	20.05	627.51	4" casins	
	2	1	20.07	40.13		32	V	20,09	647.60	1	
	3	V	20.11	60,24		33	V	20,06	662,66		
centralizer-		V	70.66	80.30		34	V	20,03	682.69		
CC. C. I. (11. E. (1) -7	کے	1/	20,12	100.42		35	V.	20,07	702.76		
	6	1	20,13	120.55	<b>Y</b>	36	V	20,06	727.82		
	7	V	20.07	140.62	LIV Casing	37	V	20.08	742.90		
Falize >	8	1	10:08	160,70		28	V	20.06	762.96		e centralize
111111111111111111111111111111111111111	9.	V _	20.08	180,78		39	V	20.09	783.05		
	10	1	20,07	200.85		40	V	20.01	803,12		
	lj.	J	20.07	220,92		41	V	70.10	823.22		_
	11.7	/	20,10	241.02		4-2	V	20,09	843.31	4	
	13	1	70,05	761.07				<u> </u>			
	14	V	20.08	281.15							_
	15.	1	26,08	301,73	,						
	16	V	20,07	321,30							
	17	. V	20,07	341,37							
Harlizel ->	18	1	20.08	361.45							_
((	19		20.08	381.53							_
	70	V	20,10	401.63							
	21	1	20.08	421,71					i k		_
	22	/	20.69	441.80							
	23	V	20.09	461.89							
	24	V	20.06	481.95				SUMI	MARY OF TALL	<u>-Y</u>	
	25	<b>V</b>	70.08	502.03		Total Le	ength ta	ıllied:	843.	≤	
	26	V	26.09	522.12		Casing	Stick-U	p:	843.°	)	
	27	V	70,10	542,22		Length	of Casi	ng Cut-Off:	3.0		
	28	V		562.31		Bottom	of Well	:	3.0 840 720	7eb (	_
t . Ir	29	i/	20,09	582.40		Screen	ed Inter	val:		840	
afealizer -	30	V	20.06	662.46	<u> </u>	Total S	creen ir	n Hole:	120		

 	 160,	
 -		

						<u></u>						A ST	25						
Staff: C. ARICO D. ANBERSON	/3 feet Rat Hole Volume: /2.0 Ft <sup>3</sup>	Borehole Diameter [D]: Annular Volume per Linear Foot: (interval) inches Ft³/Ft Ft³/Ft inches Ft³/Ft Ft³/Ft	Annular Material Description (including number of bags & bag weight and batch mix and density for slurry )	14-INCH × NO.8 TACNA FLITER PACK			4 completed u-5-14	ANNULAR MATERIALS ROMONED TO 820 FT	ON: 11-7-14 DUE TO BAD SSAL, 11-7-2	NA	NO. 20 4 40 THATS THON SAND (13 BASS)	BENTONITE CRUST, 4×50 16 BASS+ ~ 170 GAL WATER	1 . 6x " +~170gm wasa	<i>*</i>	Total Bags of Cement:	Total Bags of Bentonite Gel: 70 + 18	Total Bags of Bentonite Chips: 15		Total Super Sacks of Filter Pack: ~ 3. S + 3, 7-5
4-14-19 to	gth of Rathole: Hole Volume per foot:		Bottom of Tremie (feet)	016	800	820	820	:		780	780	240	680	029					
$ \mathcal{R}  =  \mathcal{R} $	Leng Rat	(interval)	Tagged Depth (feet)	146	BX	825	728		028	795	785	J	l	)	D <sup>2</sup> - d <sup>2</sup> ) x 0.005454				
Project No.: Dates:	feet inches	Annular Volume per Linear Foot: (in 0,43 Ft%) Ft% Ft Restrond Ft%/Ft Ft%/Ft Ft%/Ft	Calculated Depth (feet)	953	871	813	813		١	26£	644	730	140	(al 7	$\sim$	ALL DEPTHS ARE FEET BELOW LAND SURFACE			ફો:
	995	Volume per Ft%Ft Ft%Ft Ft%Ft	Total Vol. Installed (ft³)	30	(àO	84	89			101	107.5	131.3	155.7	160,1	er linear foo	ELOW LAN	s = 0.7 Ft <sup>3</sup>	100 lbs/Ft	pack is 30 F
510R	Depth:  eter [d]:	Annular 0,43	Volume Bag(s) or Batch (ft³)	30	30	42	5			12	6,5	238	74.4	14.42	subic feet pe	RE FEET B	tonite chips	and gravel =	sk.) of filter
Project: 6462510R Well ID: NSt4-009	Total Well/Casing Depth: Well/Casing Diameter [d]:	Borehole Diameter [D]:  /O inches inches inches	Weight of Sand Bag(s) (lbs.)	3000	3000	2400	500			1200	650	(	(	1	Annular volume cubic feet per linear foot =	DEPTHS AF	50 lbs bag of bentonite chips = 0.7 Ft3	Density of sand and gravel = 100 lbs/Ft3	Full super sack (sk.) of filter pack is 30 Ft3
Project : Well ID:	Total V Well/C	shole Di	>	>	>	>				>	>	>	>	7	l	ALL [	50 lbs	Dens	Fulls
		Bore	Super Sk. or Batch No.		is	W	W			7	_	_	N	3	Notes:	<del></del>			

			R											R													
Staff. C. Pruco, D. Andonson	H-13-14, H-52-14	Annular Material Description (including number of bags & bag weight and batch mix and density for slury)	BOSTANTE GROUT, OF 50 16 BYSS + ~ 170 CM WATER									h1-8-17 ∧	11-20-14 Grow DNOPPED to ~ 590 FT	7	. • •	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	BENTANTE CHIPS (3 BASS)	V (7.8845)(11-23-14)	44-INCH "NO. B TACNA CARANGE DACK				BENTONITE CHPS (5 BASS)				
	n er	Bottom of Tremie (feet)	560	500	OHH	380	320	200	2002	Chl	80	20		j	,	1	1	,	ı	1	,	-					
38681-207	h1-h-11	Tagged Depth (feet)	١	,	١		١	ŧ	١	1	١	0	~590	-	,	1	1	-	1	1	1	9	0				
Project No.:	Dates:	Calculated Depth (feet)	560	503	のみか	389	288	275	812	191	hon	47		975	ash	353	348	337	767	197	£21	25	1				
	1	Total Vol. Installed (ft3)	24.5	228.9	253.3	7.7.7	3021	326.5	350.9	375.3	399.7	1.724		4757	514.1	555.8		562.8	592.8	8,229	652.8	6753	678.8				
SioR	500	Volume Bag(s) or	h'h2	h'he	4.45	F.142	h:h2	<i>h</i> 2	h.He	FH2	24.५	h'hz		48,6	41.4	41.7	Z.1	4.9	300	30.0	30.0	22.5	3.5				
Buca	NSH-009	Weight of Sand		į	1	١	)	١	١	,	1	1		ļ	1	١		)	3000	3000	3000	2250	l				
Project :	Well ID:	>	>	>	>	>	>	>	>	>	>	>															
P	\$	Super Sk. or Batch	7	N	0	1	$\alpha$	2	3	77	12	13		_	Ŋ	W	-	N	~	7	'n	7		Notes:	·	<u></u>	

### PIPETALLY 4" SCREEN

Project Name.: EXCEUSIER	Project No.: 38081 - 204
Well No.: NSA '00 9	Date: 11-4-14
Location: NSH-CS	Pipe Talley for: St. Zent (using)
Total Depth: 995 '	Geologist: D. Ank un, (. Phil

Type of Connections: Welded T+C Flush Thread Other

Dine		Janath	Length Σ	Dina Toma	Dina		I I am male	L Longth C T	Di T
Pipe	1	Length	A Section of the Sect	Pipe Type	Pipe	1	Length	Length ∑	Pipe Type
1	-	20.58	(ft)	Ceana	3 i	1	(ft)	(ft)	CM
2		20.14	20.58 40.72	screen	32		20.13	624.18	CASING
	V	70:11	60.94		33		20.14	644.32	
3		16.17	61.14		34		10.16	684.60	
5	~	20.10	101.24	<del></del>	35		20.12	-	
6		20.26	121.47		36		20.12	74.72	
7	1	20.10	141 52		37	1	20.13	164 64	- 1
8	1	26.06	161.63		38	-	20.16	765.13	
7	/	20.08	18/11	1	19	9	20.12	785.25	
10		20.12	201 83	CASING	40		20.08	865.33	
11		20.12	21195	1	41		20.06	875.39	_
12		20.13	242 68		72	1	2016	845.55	
13		20.14	262.22		43	1	20.08	865.63	
14	-	20.14	282.36		44	10	20.03	885.66	
15	-/-	20.06	302.42		45		20.04	905.75	
16	-/	20.15	322.57		46	1	20.07	925.82	
17	9	EG .Clp	342.63		41	13	20.07	945.89	
18	//	20.06	362.64		48	3	20.07	965.96	
19		20.13	382.82		49		20.08	946.04	
20	-/	20.07	402.89		50		70.12	1006.16	
21		20,06	412 95		Si	1	3010	1026.26	- DOUT
22		20.18	443.13						
23		2000	463.19						
24		20.14	483.53				SUMN	ARY OF TALL	Υ,
25	/	20.0+	503.40		Total Le	ength ta	llied:	1006.	2
26		20.13	523.53		Casing	Stick-U	p:	11.0	
27	1	20.14	543.67	-	Length	of Casir	ng Cut-Off:	11.0'	(1)
28	1	20.14	563.81		Bottom	of Well:	:	995'	
19	1	71.10	583.71		Screene			813-	195'
30		20.14	604.05	<u> </u>	Total So	creen in	Hole:	181.7	1

Votes:	4.5"	QD.	4 1D	ASTM	453B	ASMESRI
	JY CEN	UTRALIZ	ER INST	ALLES		
	<del></del>					

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Page

Staff. Chad Price, Dane Anderson, C. Gardner	Ft³/Lin. Ft  Borehole Diameter [D]: Annular Volume per Linear Foot: (interval)   Ft³/Ft   inches   Ft³	Annular Material Description (including number of bags & bag weight and batch mix and density for slurry)	48 Bags -47 lb bag coment + water + Cacl	160 gal water + 6-50 ile bug Bentonite	Same	Same	Same	Same	Samo	Same	Same	Samo	Same	Total Bags of Cement: 48	Total Bags of Bentonite Gel:	Total Bags of Bentonite Chips: 66	Total Bags of Transition Sand:	Total Super Sacks of Filter Pack: —
3 1	er foot	Bottom of Tremie (feet)		[	434	434	354	354	767	744	194	139	139					
38681-	Length of Rathole: Rat Hole Volume p (interval)	Tagged Depth (feet)	984	Ì	1	1	J	1	١	1	1	\		) x 0.005454				
Project No.: Dates:	epth: \$46 feet  2 6/8 inches 8.625  Annular Volume per Linear Foot: 5 5 Ft/Ft Ft/Ft Ft/Ft Ft/Ft	Calculated Depth (feet)	494	451.6	409.2	3.66.8	324.4	282	239.6	197.2	154.8	112.4	70		D SURFACE			ા
	\$46 \$ 5/8 \$ .625 Volume per Ft/Ft Ft/Ft Ft/Ft	Total Vol. Installed (ft³)	28.5		75.	98.4	121.7	145	168.3	191.6	214.9	238.2	261.5	Annular volume cubic feet per linear foot = ( $D^2 - d^2$	ALL DEPTHS ARE FEET BELOW LAND SURFAC	s = 0.7 Ft <sup>3</sup>	Density of sand and gravel = 100 lbs/Ft	Full super sack (sk.) of filter pack is 30 Ft
0.	i Depth: eter [d]: Annular o, s.s	Volume Bag(s) or Batch (ft³)	28.5	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	ubic feet pe	E FEET B	tonite chips	and gravel =	sk.) of filter
Excelsion NSH-010	Total Well/Casing Depth: Well/Casing Diameter [d]: Borehole Diameter [D]: Annu   3.2.5 inches   0.55   inches	Weight of Sand Bag(s) (lbs.)												ar volume c	EPTHS AR	50 lbs bag of bentonite chips = 0.7 Ft3	ty of sand a	s) ack (
Project : Well ID:	Total V Well/C Well/C	>	>	/	>	>	>	>	>	>	7	7	1	Annul	ALL D	50 lbs	Densi	Full st
¥ ×	Boret	Super Sk. or Batch No.	_	7	ч	7	N	9	7	8	6	01	7	Notes:				

Staff: C. Price, D. Anderson, C. Gracolner	(inc	Total 66 Bags of Bentonite										-> 42.4 ft3/linft			
38681-203	Bottom of Tremie (feet)	139										23.3 科3			
	Tagged Depth (feet)	0										Sentonite =			
Project No.:	Calculated Depth (feet)	27.6										Dues Ben	i		
	Total Vol. Installed (ft³)	284.8					Ē					4105-9			
io/ >10	Volume Bag(s) or (ft³)	23.3										water +			
Excelsion	Weight of Sand (lbs.)											735	ם כ		
Project : Well ID:	>											160			
Pr	Super Sk. or Batch	12										Notes:	•	•	

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Page	 of	 <u> </u>

### PIPE TALLY 8" CASIN

		1477				Ψ		- 1/ /41		
		EXCER	SOR			Project	No.:	38681		
/ell No.		4-01	0	- 15		Date:	<u> [[]                                  </u>	114	· U	
ocation		H-C7				Pipe Ta Geologi	ley for:	8 79	. U 8_ CASIN	JO
otal De	pth: _<	54 Ca 1	FT bls			Geologi	st: ت	· PRK	BICI	GARANON
pe of (	Connect	ions:	Welded 🚨	T+C	Flush Th	read 🖵	Othe	r		
Pipe	1	Length	Length Σ	Pipe	Туре	Pipe	1	Length	Length ∑	Pipe Type
•		(ft)	(ft)	04-	A . M		- V.	(ft)	(ft)	
	X	10.15	20.13	8 60	ANK				·	
3	X	20.10	40.23			-				
	X	10.11	60.34		-	<b>├</b> ─┤		-		
4	X	20.11	80.45			<b> </b>			7.7	
5	×	70.11 20.11	100.56			$\vdash$	_	-		
68KJ 9-1	X	20.11	120.67	N.						
7	~		140.78							·
13	×	20,11	160,89							
9	×	20.11	181.00							
VO	×	20.12	201.12							
VI	يعز	20.11	321,23					*		
2	O.	20.12	241.35							
7	X	20.12	261,47							
34	Ŷ	20.11	281.58		1					
5	X	20.10	301.68	_		_				
10	*	20,13	321,81			1				
1	X	70,12	341.93							
12		7017	362.05			,				
1.9	X	70.2	382.17			+				
70	X	70.6				4				
2)	-X	20.13	402.30			-				
21	×	20.12				<del> </del>		1		
12	X	30.13	442.54			-				
<u> 보기</u>	X	20.13				-			<u> </u>	
24	X	30.11	482.78			4		SUMN	563.2	و م
5	7	190.19	502,90			Total Le	-			<u>)</u>
26	X	20.11	523.03			Casing	Stick-Up	):	0	
27	X	20,11	543,14			Length	of Casin	g Cut-Off:	11.93	
28	X	20.11	563,25		V .	Bottom	of Well:		546'	
	- 1					Screene	d Interv	al:		
	22					Total So	reen in	Hole:		
otes:	8 5	ods loint: eveled	5 65 ends	18 T.	OD STM	LC As	·5 3	0.2	25" W	all thickne
1				8	16	I	)			
	-		100							

Staff: C. Price, thyle Mohr	11-50-14	ot: 0.78 Ft³/Lin. Ft	Borehole Diameter [D]: Annular Volume per Linear Foot: (interval)  ( 4 inches	Annular Material Description (including number of bags & bag weight and batch mix and density for slurry)	14"xNO8 Tacua	14"x No. 8 Tacka. Used only a Fract SK	No. 20x40 transition sand lor Soll bags	1/0 20x40 transition can & SSO16 buys	NO. 20 XW THAS FOUR GX5016 GAYS	150 gal of water + S bags of bataile 666						Total Bags of Cement:	Total Bags of Bentonite Gel: 67 + 23 = 90	Total Bags of Bentonite Chips: 3	Total Bags of Transition Sand: 2	Total Super Sacks of Filter Pack: 2
		athole: lume per foo	2 <i>h</i>	Bottom of Tremie (feet)	091	368	3.5%	395	375	(	,	ι	1	)	\					
202-18985	11-10-14	Length of Rathole: Rat Hole Volume per foot:	ver Linear Foot: (interval) 490 -445 145-442 442-423・378・341・34-342 423・378・341・34・342	Tagged Depth (feet)	456.5	421.5	416.3	4133	0.604	1	1	1	Í	,	١	) x 0.005454				
Project No.:	Dates:	feet inches	Annular Volume per Linear Foot: (interval)  2,61 Ft*/Ft 490-445  2,67 Ft*/Ft 442-442  3,74 Ft*/Ft 473-378:341-341:344	Calculated Depth (feet)	458.7	419.5	4KI, 7	413.0	409.8	386.79	349.03	320.02	288,26	2%,50	224.74	$t = (D^2 - d^2)$	FEET BELOW LAND SURFACE			راع الع
		490	Volume per Ft*/Ft Ft*/Ft Ft*/Ft 4Z	Total Vol. installed (ft²)	30	60	59	67.3	70.3	82.8	117,3	140.8	164,3	8781	211.3	er linear fool	ELOW LAN	= 0.7 Ft³	100 lbs/Ft	pack is 30 F
نور	210	Depth:  eter [d]:	Annular 0,67	Volume Bag(s) or Batch (ft³)	30	30	8	2.3	2	23.5	25.5	23.5	23.5	23.5	23.5	ubic feet pe	E FEET BE	tonite chips	ind gravel =	sk.) of filter
Excelsion	10-4/50	Total Well/Casing Depth: Well/Casing Diameter [d]:	Borehole Diameter [D]:    \( \lambda \) inches    \( \lambda \) inches    \( \lambda \) inches    \( \lambda \) inches	Weight of Sand Bag(s) (lbs.)	5000	3000	500	250	350							Annular volume cubic feet per linear foot = ( $D^2 - d^2$	ALL DEPTHS ARE	50 lbs bag of bentonite chips = 0.7 Ft <sup>3</sup>	Density of sand and gravel = 100 lbs/Ft3	Full super sack (sk.) of filter pack is 30 Ft3
Project :	Well ID:	Total Well/C	shole Dia	>	>	7	>	7	7	>	7	>	>	7	>	Annul	ALL E	50 lbs	Densi	Fulls
<u>d</u>	5		Bog	Super Sk. or Batch No.	_	7	-	7	n	_	2	2	7	N	9	Notes:				

~220 FEBT, 11-207 र्धा BENTONTE GEL 201 745 OF BENTONITE BENTANITE GOL (including number of bags & bag weight SUNFACE and batch mix and density for slurry of beathrite 1 (2 5KS) . SK Annular Material Description 59.95 5095 10 MOHR 300 gal wATER + (0 BA65 0F 3465 CHPPS 3A65 のまな 5 P J 150 gal water + 5 bags 万万 5877250 300 god WATER + 6 BENTONITE 3/8 INCH BONDONTE ya Ki 72/2 C. PRICE, 300 gall WATTER + AFTER INTERN challos5 9411015 प्रकार प्रा 3/8- INCH Staff: 3 S ĭ -7 11-20-Depth (feet) Tremie (feet) Bottom of 1 Į Dates: 11-10-14 Project No.: 38681 Tagged 0 1 Calculated 108,70 195.73 166.72 Depth 89.05 69'66 22.52 (feet) 127.71 63 167 100 5/852 38797 5565 Installed 430.7 Total Vol. 352.3 429.3 54.8 328.8 375,11 4724 234,8 81182 305.3 514.1 Bag(s) or (ft²) Volume 18.22 23.5 12,71 Project: EXCEL SIDS 23.5 23.5 23,5 23.5 40 23,5 NSH-012 1/2 Weight of Sand (Ibs.) Well ID: > > > Sk. or Batch Notes: 9 M 2 N M 9 9 7

Page \_\_\_\_ of \_\_\_\_

			سرا	PIPE	ΓALLY	, L	1 1/2" C	ASING		
Project N	Jame :	Excelsi	inf.				38681			٦
		H - 0 1			Date:	11-11	0-14			1
Location	: 1150	4-CU						casing		1
		10a+ 4	190'		Geolog	ist: C	. Price	9		
				T+C - Flush Th	read C	Othe	er			
Pipe	1	Length (ft)	Length $\Sigma_{\cdot}$	Pipe Type	Pipe	1	Length (ft)	Length ∑	Pipe Type	
1	1	20,09		Screen w/b	VII NO	50 5			ralizer at	Tootto
2	1		40,25	screen	1	/	J	32.11.	7,100	1
3	1	20.02	60.27	screen w/	C aut	ralis	-× N	From	top of sc	W POLA
	1	20.09	80.36	Lasing	Cek	1001112		0 101	10000	Jeen
5	1	20.02	100.38	Cosing						1
6			120.43	casina				·-		1
15	1		140.44	1					L.	1
8	7		160.51							1
9	<b>-</b>		180.59			1				1
10	<u> </u>		200.63							1
11			220.65		<del>                                     </del>			-		1
12	\ <u>\</u>		240.71		<del>                                     </del>					-
13	/		260.79		<del>                                     </del>					1
14	\ <u>`</u> /		280.87		<del>                                     </del>			1		1
15	Ž		300.92							-
16		20.22	321.14		<del>                                     </del>					┨
10	· /		341,20		<del>                                     </del>					1
18	<del>-                                    </del>	20.10	361,30		_			<del> </del>		-
19	<del>-                                    </del>	20.10	381,40		<del> </del>	1				-
20	<del>- //-</del>		401.55		_					-∥
21	/		421.64	-	-		<del>                                     </del>			$\dashv$
22	<del>- V</del>	20.09	441.72					- 17	7	$\dashv$
	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	·		16	-					┨
23	V,	20.16	461.88	-	-	ļ				-
24	1	20.16	482.04	V	-			MARY OF TALL		
25		20.12	502.16		7	ength tal		502.1	0	-
<u> </u>		1				Stick-Up		2.51		-
<b></b>					7		ng Cut-Off:			$\dashv$
<u> </u>		-			7	of Well:		490.27		
					٦.	ed Interv		430'-	490,27'	- I 7, ,
				<u> </u>	Total S	creen in	Hole:	60.27		
		OD cosing	AST.	M A53B	-	L 65				
		Till no		.89' 05 cc	sina	<e+< td=""><td>above</td><td>land s</td><td>surface.</td><td>_/</td></e+<>	above	land s	surface.	_/
92	70	· · (1 / V )	1012 11	. 0 1 0 - 004	J	26,	2000	iwrig :	JULI GOEL	<del>-</del>
										_
	23	tremie	rods 1	20'						_
	1	bevele		pmie rod				11 12/		_

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Page 1 of 2 ANNULAE

Staff: C. Parce	-1-	ot: feet Rat Hole Volume: Ft³/Lin. Ft	Borehole Diameter [D]: Annular Volume per Linear Foot: (interval) inches	Annular Material Description (including number of bags & bag weight and batch mix and density for slurry )	26 bags cement, I bug quick ged	ᆟ	Same	Saure	Seme	Sant	Som	Same	Sent			Total Bags of Cement: 26	Total Bags of Bentonite Gel: 78	Total Bags of Bentonite Chips: 6	Total Bags of Transition Sand: —	Total Super Sacks of Filter Pack: 1.25
	11-21-21	thole: ume per foc		Bottom of Tremie (feet)	900	560	520	940	9440	360	298	285	282	282	180					
38681-	Dates: //-6-/4	Length of Rathole: Rat Hole Volume per foot:	it: (interval)	Tagged Depth (feet)	1	1	)	(	1	(		l	\	1	)	) x 0.005454				
Project No.:	Dates:	feet inches	Annular Volume per Linear Foot:  3.52 Ft³/Ft 64/6 -  5.59 Ft³/Ft Zo - ¢  Ft³/Ft Ft³/Ft	Calculated Depth (feet)	597. 2	\$52.2	506.4	7.096	8.414	371.5	328.7	282.9	237.1	191.3	145.5		D SURFACE			કો
		646 feet 8.625 inch	Volume per Ft*/Ft Ft*/Ft Ft*/Ft	Total Vol. Installed (ft³)	4.25.4	49.2	73.0	8.%	3.021	144.4	7.891	761	215.8	239.6	263.4	Annular volume cubic feet per linear foot = ( $D^2 - d^2$	ALL DEPTHS ARE FEET BELOW LAND SURFAC	; = 0.7 Ft³	Density of sand and gravel = 100 lbs/Ft3	Full super sack (sk.) of filter pack is 30 Ft3
0	13	Depth: eter [d]:	Annular V 0.52	Volume Bag(s) or Batch (ft <sup>s</sup> )	h.22	23.8	23.8	23.8	23.8	8:27	23.8	23.8	8.52	8'82	8'22	ubic feet pe	E FEET BE	50 lbs bag of bentonite chips = 0.7 Ft3	nd gravel =	sk.) of filter
Excelsior	NSH-013	Total Well/Casing Depth: Well/Casing Diameter [d]:	Borehole Diameter [D]:  13 inches  inches inches inches	Weight of Sand Bag(s) (lbs.)												ar volume c	EPTHS AR	bag of ben	y of sand a	per sack (s
Project :	Well ID:	Total V Well/Ca	ole Dia	>	7	7	2	>	7	7	>	7	7	7	7	Annuk	ALL D	50 lbs	Densit	Full su
	Š		Boreho 13	Super Sk. or Batch No.	1	1	2	3	b	8	9	7	8	6	01	Notes:				

Staff: C. Parc.	<i>71-</i> 2	Annular Material Description (including number of bags & bag weight and batch mix and density for slurry)	6 Bugs Bentonsk and		Same.			3/8 INCH BEAUTINITE CHIPS ( 10 EAGS) (1213-14)	KNO. S TACNA GAAGE										
	(12-13	Bottom of Tremie (feet)	140	140	٥			1	١										
38681-	11/8/14	Tagged Depth (feet)		١	0		275	1	0										
Project No.:	Dates:	Calculated Depth (feet)	99,7	53.9	8.1			49	0							wite ged	Cement	guet get	)
	,	Total Vol. Installed (ft³)	2,082	311.0	334.8			339,0	376.5							Bentorte	\$5		·
Excelsion	2/0	Volume Bag(s) or (ft³)	23,8	23.8	23.8			24	37.5							8 bags	26 Bug	2	
EXC	NS H-013	Weight of Sand (lbs.)							3750							78			
Project :	Well ID:	>	7	7	7	$\perp$		\	>										
à	<i>S</i>	Super Sk. or Batch	-	75	13				+/							Notes:	= -,		

### PIPE TALLY 8" CASING

		_
Project Name.: Excelsion	Project No.: 38681	]
Well No.: NSH-013	Date: 11-5-14	
Location: NStr-BW	Pipe Talley for: intermediate Casing	∥ ୫ ⋅
Total Depth: 450 646	Geologist: C. Price a Jason Mach	]

Type of Connections: Welded T+C Flush Thread Other

Pipe	i di iya g	Length	Length Σ	Pipe Type	Pipe		Length	Length ∑	Pipe Type			
	1	(ft)	(ft)			<b>V</b>	(ft)	(ft)				
$\Box$		20,12	_	IN+ Casing	31	/	20,12	623.73	int casivo			
2		20.13	40.25	,	32	<b>V</b>	20,13	643,86				
3	V	20.11	60,36	/	33	<b>\</b>	20,12	663.98	/			
4	<i>V</i>	20,14	80.50									
5	<b>V</b>	20/12	100.62									
6	V	20,12	120.74									
7.	<b>V</b>	20:11	140.85									
8	V	20,13	160,48									
9	<b>V</b>	20,12	191.1									
10	<b>✓</b>	20,11	201,21									
1/	V	20.12	221,33									
12	<b>/</b>	20,12	241,45									
13	<b>/</b>	20,13	261.58									
14	<b></b>	20.12	281,70		<u> </u>							
15	V_	70.11	301.81					ļ				
16	V	20.11	321,92						3			
17	V .	20,12	342,04									
17	<b>✓</b>	20,13	362.17					1/4				
19	<b>V</b>	20.12	382,29						1-1			
20	<b>V</b>	20.11	402.40									
21	\ <u>\</u>	20.11	422.51									
22	V	20112	442.63									
23	$\vee$	20:73	462.76									
24	/	20.11	482.87				SUMN	MARY OF TALL	.Y			
25	V	20.11	502.98		Total Le	ength ta	llied:	663.9	8'			
25	<i>\</i>	20.13	523 111		Casing	Stick-U <sub>l</sub>	o:	<u>4'</u>				
27	/	20.13	543,24		Length	of Casir	ng Cut-Off:	14.9'				
28	Y	20,13	563,37		Bottom of Well: 646'							
29	$\bigvee$	20,12	583.49		Screened Interval:							
30		20112	603.61		Total So	creen in	Hole:					

Notes:

898" OD LLS	0,250 wall thickness, bevolve ouds,	***
87/16" IN ASTM A53		1
ASTM A53		JOH .
		9
		JI.
		1
		15

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of water Annular Volume per Linear Foot: (interval) un her 175-200 gallers water 20-54rface 6 bass of bontonite growt, 400 gallons water 100-360 Hucker 2001-02 NO.20 x NO.40 Trous! 1.00 Sano 乱 c2-0h 175-700 gallons 00--00 (including number of bags & bag weight and batch mix and density for slurry) 11,11 X NO.8 TACKA Partial SuperSK of water, Total Super Sacks of Filter Pack: ~ 1. ₹ + 2. 5 Annular Material Description 4 lass of berbuile group , 175-200 4 Ft³/Ft Ft³/Ft Ft³/Ft Ft³/Ft 19 bass of berdonile, -1100 gallons 1/2 1/2/0.8 Tacka Super 5/ Rat Hole Volume: of benton the grout 79 bays of barbaile grout, (cook 0,526 6,708 0.580 126.0 2,182 Total Bags of Bentonite Chips: Total Bags of Transition Sand: Total Bags of Bentonite Gel: Staff: Jaso Total Bags of Cement: 0, 4/92 Ft3/Lin. Ft Borehole Diameter [D]: 9 bags of inches inches inches inches feet 11-21-2014 to 11-23-2014 36095 (3,75 20,5 52,21 0.8 1.25 Rat Hole Volume per foot: 1200 Bottom of Tremie 029 0717 920 760 (feet) 3 820 020 760 580 700 Project No.: 38681-204 Length of Rathole: Annular volume cubic feet per linear foot = (  $D^2$  -  $d^2$  ) x 0.005454 Annular Volume per Linear Foot: (interval) 1210 **Tagged** 1170 1160 Depth (feet) 760:-1230 230-1140 1940 700 0921-1260 Dates: ALL DEPTHS ARE FEET BELOW LAND SURFACE Calculated 1159,7 Depth (feet) 95/ 925 046 222 1199 786 583 791 726 inches 537 679 feet Full super sack (sk.) of filter pack is 30 Ft Density of sand and gravel = 100 lbs/Ft3 Total Vol. 308.7 2,968 Installed 332.9 231.2 405 4 253,7 357.0 50 lbs bag of bentonite chips = 0.7 Ft<sup>3</sup> 1200 47.4 51.9 305 25 £ 30 Ft³/Ft 0.492 Ft3/Ft 0.362 FP/Ft 0. 463 FP/Ft 617,172 Bag(s) or 0.435 Volume 24.18 153,1 1612,0 Batch 24,18 30 4,5 55.0( (F) Total Well/Casing Depth: Well/Casing Diameter [d]: NS-1-01413 17.4 Excelsion Weight of 120 Borehole Diameter [D]: 3000 Bag(s) 450 Sand (Ibs.) inches inches inches inches Project: Well ID: 7 (0.25 5 0 2 Sk. or Batch Notes: No. ユ S 4

Page 2 of 2

## **ANNULAR MATERIAL RECORD**

52/11 N of sale 7 -65 FBET 1 BAG 6 BAGS (including number of bags & bag weight S BAY6S and batch mix and density for slurry SANO ST 80-100 gallons Annular Material Description Denteriale grout, 175 200 gallons 1× おったしら OFFPS 2 8 BENTON IT CHIPS 38 - MCH BENTANITE CHPS Dropped POA-GRANGE 864-6245E AFTOR INSTALLATION Ceok, D. BONTON ITE partonite SURFACE. Staff: J. 3/8-1404 5995 78-1NCH 3/8 - INCH 11-52-11 3643 Depth (feet) Tremie (feet) out of hole Bottom of 220 282 4 940 200 1 Dates: (1-21-14 Project No.: 3868 Tagged System 0 Calculated Depth 229 (feet) 265 355 145 212 187 122 103 00 399 200 34 16 Total Vol. Installed 683.47 9,824 477.9 526.7 598,8 623.0 58.5 502.1 574,6 n' 129 453 Hole. 647 Bag(s) or Volume 30.0 27.6 12.09 3.01 N 20 Project: OXCE SIDR Well ID: NSH-ON IS 7 Ö Weight of 4500 Sand (lbs.) 3000 > 2 >  $\geq$ Sk. or Batch Notes: N 20  $\bar{c}$ 7 Ó 5 12/ 0 = 2

### PIPE TALLY 4" CASING

Project Name.: Excels Tol	Project No.: 39361 3868
Well No .: NSH-014B	Date: 11/21/19
Location: NSH-DN	Pipe Talley for: Ven mstall
Total Depth: /2(00)	Geologist: J. (sok, D. Hunker

Type of Connections: Welded T+C Flush Thread Other

Pipe	76 AST V	Length	Length Σ	Pipe Type	Pipe		Length	Length Σ	Pipe Type					
	<b>√</b>	(ft)	(ft)			✓	(ft)	(ft)						
	V	20.05	20.05	4" Scren	31	V	20,07	621.77	4" BLANK					
2	V,	20.06	40.11	1	22	./	20.04	641.81	1					
3	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	20.10	60.21		33	<b>V</b>	20,07	661.88						
4	12	20,08	80,29	¥	711	1/	20.04	681.92						
5	V.	20,01	100.3	4" blank	35	V	2001	701.93						
6	V	20.03	120.33		37		20.05	721.98						
7	V	20,04	140.37		37	/_	2010	742.08	d					
8	<b>\</b>	20.02	160.39		38	<b>V</b> ,	20,03	762.16						
9		20.03.	180.42		34		20,07	782,23						
10	<b>V</b>	20.07.	200.49		40	<u> </u>	20.07	802.3						
11	ν	20.09	220.58		ΫI	<b>√</b>	20.06	822.36						
12	V	20.08	240,6		42	V	20,07	842.43						
13	V,	20:10.	260.7		43	1	2001	862.44						
14	V	2908	280.78		44	/	10.07	882.51						
15	N,	20,02	300.8		45	<u> </u>	20:03	902.54						
16	V	20.07.	320.97		46	V,_	20.06	922.6						
17	J	20,06.	340.93		47	<u> </u>	2000	942.66						
18	J,	20.06	360,99		48	/	20,02	962.68						
19	$ \mathcal{J}_{\mathcal{I}} $	20.06	381.05		44	<b>√</b> /	20,02	982,7						
20	1//	20.05	401.1		50	1/	20,03	1002.73						
21	W/	20,08	421,18		SI	V/	20:08	1022.81						
22	V	20.5.	441,28		52	V,	20,09	1042.9						
23	1	20.05	461.28		53	_ <	20,07	1062.97	A					
24	1	20,03	481.31		1		SUMN	ARY OF TALL						
25	V	20:01	501,38	1	Total Le	ength tal	lied:	1263.4	7 ++					
26	V	20.04	521,42		Casing	Stick-Up	):							
27	V,	70.06	541,48		Length (	of Casin	g Cut-Off:							
7.2	1	20,08	561.56		Bottom	of Well:		1260						
20	V	20.08	581,64		Bottom of Well:   12.60									

Notes:	Scien is 4.5"00	LCS	Sciec	n. 0.125	15/0/5
	0.237 0.250 (29	11 FG	cknes	5	
	(white, 12, 115" DD	LSS	PIRC.	0.250 WALL	+hich res
	4-5			0.237	
X 33	surmed as 20.07 -DY				
	****				

Total Screen in Hole:

80 FX

### PIPETALLY 4" CASING

					IALLI				
Project I	Name.:	Exulsa	۶ (		Project	No.:	38681		
Well No.	: NS	4-014	В		Date:	11/2	1/14		
Location	1: NS	H-DN			Pipe Ta	lley for	Wen	nstall	<u></u>
Total De	pth: /	260			Geologi	ist: خ	1. 600K	, Ditto	uch
Type of	Connecti	ions: 🔼	Welded 🚨	T+C  Flush T	hread	Othe	er		
Pipe		Length	Length Z	Pipe Type	Pipe		Length	Length ∑	Pipe Type
	1/	(ft) <b>∑</b>	(ft)			<b>√</b>	(ft)	(ft)	
5U	1	1683.03	20.06	T .					
55	<b>/</b>	11.8011	20.04						
5U 55 51	<b>V</b> ,	1123.15	20.04						
57	<b>√</b>	1143.17	20:02						
58	<b></b>	1163.25	20.08						<u> </u>
54	1	1183,3	20,05						*
60	J,	1203.31	2001						
91	<i></i> ,	1223.33							
67	1/	1243.43	20,10						
63	~	1263.47	70.04						
					╛		SUMM	ARY OF TALLY	7
					Total Le	ngth tal	lied:	1263.47	<i>r</i> 44
					Casing			· ·	
<b> </b>					Length	of Casir	g Cut-Off:		
<u></u>					Bottom	of Well:		1260	2.1.0
<u> </u>					Screene			1180-1	260
	<u> </u>				Total Sc	reen in	Hole:	80 \$1	
Notes:									
									-4
-									
<del></del>									
80	-		-						
								1-100	

		·				ater														1
Staff. Hyle Mohr, Hendre Ford	7.1	feet Rat Hole Volume: Ft³/Lin. Ft	Borehole Diameter [D]: Annular Volume per Linear Foot: (interval) inches Ft³/Ft Ft²/Ft Ft²/Ft inches Ft³/Ft	Annular Material Description (including number of bags & bag weight and batch mix and density for slurry )	6 Buys Bentonite chips	24 Bays cement, 1 Dag gwick gel, 1 Dag Call, ~200 gally after	bags Bentonite	Same	Same	Same	Same	Same	Same	Samt	Same	Total Bags of Cement: 24	Total Bags of Bentonite Gel: 🚜 🖰	Total Bags of Bentonite Chips: 6 + 2	Total Bags of Transition Sand:	Total Super Sacks of Filter Pack: 1.75
2003	41-42-11	of Rathole: le Volume per foot:	Δ ' ' ' '	Bottom of Tremie (feet)		260	(	١	\.	(			1	ļ.	{					
38681-	11/13/14	Length of Rathole: Rat Hole Volume p	(interval)	Tagged Depth (feet)	1	1	١	1	1	١	١		1	{	1	x 0.005454				
Project No.:	Dates:	feet inches	Annular Volume per Linear Foot:	Calculated Depth (feet)	677.0	514.13	468.94	423.75	378.56	333.37	288.18	242.99	197.80	19.251	107.42	Annular volume cubic feet per linear foot = ( $D^2 - d^2$ ) x 0.005454	ALL DEPTHS ARE FEET BELOW LAND SURFACE			ر دن دن
		585	Volume per Ft³/Ft Ft³/Ft Ft³/Ft	Total Vol. Installed (ft³)	4.14	36.93	60.33	83.83	107.33	130.43	154.33	177.83	201.33	224.83	248.33	ar linear foot	ELOW LAN	= 0.7 Ft <sup>3</sup>	Density of sand and gravel = 100 lbs/Ft3	Full super sack (sk.) of filter pack is 30 Ft <sup>3</sup>
0	5	Depth: eter [d]:	Annular V S &	Volume Bag(s) or Batch (ft³)	41.14	32.69	23.5	23.57	5.22	23.5	23.5	23.52	23.5	23.5	23.5	ubic feet pe	E FEET BE	tonite chips	nd gravel =	k.) of filter p
Excelsion	210-HSD	Total Well/Casing Depth: Well/Casing Diameter [d]:	Borehole Diameter [D]:  13 inches inches inches inches	Weight of Sand Bag(s) (lbs.)												ar volume c	<b>EPTHS AR</b>	50 lbs bag of bentonite chips = 0.7 Ft3	y of sand a	iper sack (s
Project :	Well ID:	Total V Well/Ca	nole Dia	>	>	>	>	7	7	7	>	>	7	7	/	Annuk	ALL D	50 lbs	Densit	Full su
P.	\$		Borel	Super Sk. or Batch No.	-	_		2	~	ħ	۶۷	9	7	8	6	Notes:				

Staff. Hyle Mohn, Kendva Ford	11-67-11	Annular Material Description (including number of bags & bag weight and batch mix and density for slurry )	Same	Same	Same	Same	Same		5-50 15 bugs Bentonite ~ 3/4 of batch used	on 11-24-14 Group HAN Dropped to	~85 FEET	3/8-14CH BENTONITE CHIPS (11-24-14)	38-INCH PEA-GRAVEL (1.75 5KS)						5 -> 45.19 \$13/1m. ft	nt, I bug guick a	7	
03		Tagged Bottom of Depth (feet)	Į	ì	1	1	١	١	1		1	(	ı	Ē					sty 5.82 =	bags Cement	1	
	11-13-14	Tagged Depth (feet)	1	l	١	(	١	1	0		~85	(	0						Renton: to	1 7	.	
Project No.:	Dates:	Calculated Depth (feet)	62.23	17.04	- 28.15	-73.34	-118.53	-163.72	-208.91			83	0						4	1		
		Total Vol. Installed (ft³)	271.83	295.33	318.83	342.33	365.83	389.33	412.83			414.2	466.7.						1 he he	2		
رة أ	15	Volume Bag(s) or (ft³)	23.5	23.5	23.5	23.5	53.5	23.5	23.5			1.4	52.5						41 62 -77 +		•	
Excelsion	NSH-018	Weight of Sand (lbs.)	1	}	١	,	J	١	ţ			1	5250						150 021	לי		
Project :	Well ID:	>	>	>	>	7	7	>	>			>	>									
Pri	3	Super Sk. or Batch	01	11	21	13	王	ī	91			\	1,2						Notes:			

PIPE TALLY for Casing

Project Name.: Exculsion	Project No.: 38681-203
Vell Site: NSH - 0/5	Date: 11/13/14
ocation: NSH-C)	Staff: K. Motte

Туре		nections:	☑ Welded	☐ T+C ☐	Flush	Thread	Other					
Pipe	1	Length (ft)	Length ∑ (ft)	Pipe Type	Pipe	1	Length (ft)	Length ∑ (ft)	Pipe Type			
1	1	20.13	20.13	8" cusing								
2		20.12	40.65	0								
3		70.12	60.37									
4	/	20.12	80.49		ļ							
5	/	20.14	100.63									
6	1	20.12	120.75									
7	1	20.13	140.88			ļ						
8	<i>4</i> ,	20.14	161.02			ļ						
9	1	20.13	181.15		-							
10	1/	20.13	201.28		-							
11	1	20.11	221.39			-						
12		20.12	241.51			-						
13	1/	20.15	261.66		-	-						
14	/	20.13	281.79		-	-						
15	/	20.14	361.93		-	-						
16	1	20.15	322.08		-	-						
17	1	20.15	342.23		-							
18		20.16	362.39		-	1						
19		20.16	382.55									
20	1	20.15	402.70						<u> </u>			
21	1./_	20.14	422.84		4	-						
22	1	20.15	442.99		-				+			
23	1	70.13	463.12		-			1				
24		20.16	483.78			·		1				
25	1	20.16					CLINABAA	RY OF TALLY	,			
26	1/	20.15	523.59			- طامصدا		een tallied (ft.):				
7.7	1	20.12										
78		20.13				Length of casing cut off after landing (ft.): 17.42  Bottom of Casing (feet, bls): 585.2						
24	1	70.13		100				o).	1.40'			
30	1	70.14		Cut off	_	up (ft, a		e/·	1. 70			
		1-17.47	586.69				erval(s) (ft.b screen in ho					
L				1	Total	ieet of 8	ou cell III IIO	ic (it.).				

Notes:			, /	70	
Notes:  Have 30 jamts of  TD ~ 582.2 feet	Casing	expected	to only	03e~29	
11) ~ 586.2 (11)					

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Page	

Staff: 1/2 Moth	feet Rat Hole Volume: Ft3	Borehole Diameter [D]: Annular Volume per Linear Foot: (interval) inches inches Ft³/Ft Ft²/Ft Ft²/Ft	Annular I (including num and batch mix	6 Bogs Able Rug ~ 8.08 Pt3/IMPt Fist	40 bays coment, 180 gas water, 1 bay 60 61, 1/1 bay of work gel	Quilc grout, 50 165 160	6 bags Quil Grout, 50 165	b bags Quit avout, 5016	-50165	6 bags - 50 16, Quil grown	6 bags - 50 162 Quilly rout	- 50 160 avit	bugs - 50765 Remboute	Sloads. 5016 Restricte = 150 gal water	Total Bags of Cement: $40$	Total Bags of Bentonite Gel: 78	Total Bags of Bentonite Chips: 6 ← 3	Total Bags of Transition Sand:	Total Super Sacks of Filter Pack: /. 5
HI-42-11	Length of Rathole: Rat Hole Volume per foot:		Bottom of Tremie (feet)	560	240	500	500	760	760	380	3 80	300	300	220					
38681-203	Length of Rathole: Rat Hole Volume p	(interval)	Tagged Depth (feet)				1	1	}			1			x 0.005454		g as gal	>	
Project No.: Dates:	feet inches	Annular Volume per Linear Foot:	Calculated Depth (feet)	571.34	523.81	482,7	441.5	400,3		317.9	276.7	235,5	194,3	149,1	Annular volume cubic feet per linear foot = $(D^2 - d^2) \times$	FEET BELOW LAND SURFACE	7.48		:1:
	9.625 inch	Volume per	Total Vol. Installed (ft³)	4.2	28.9	50,3	71.7	93,1	14.5	135.9	157.3	178.7	7.002	3.527	er linear foo	ELOW LAN	s = 0.7 Ft³	Density of sand and gravel = 100 lbs/Ft <sup>3</sup>	Full super sack (sk.) of filter pack is 30 Ft <sup>3</sup>
2	g Depth: neter [d]:		Bag(s) or Batch (ft²)	2.h	7.4E	21.4	4.16	21.4	21.4	21.4	21.4	21.4	412	23.5	subic feet p	RE FEET B	50 lbs bag of bentonite chips = 0.7 Ft <sup>s</sup>	and gravel :	sk.) of filter
Predeto	Total Well/Casing Depth: Well/Casing Diameter [d]:	Borehole Diameter [D]:  13 inches inches inches inches	Weight of Sand Bag(s) (lbs.)												ar volume	ALL DEPTHS ARE	bag of ber	ty of sand	uper sack (
Project: Well ID:	Total Vell/C	orehole Di	or ch	>	>	>	>	>	>	> 4	>	> A	8	2		ALL E	50 lbs	Densi	Fulls
		<u> </u>	Super Sk. or Batch No.				4	-	2						Notes:				

Staff. Hye Moh		Annular Material Description (including number of bags & bag weight and batch mix and density for slurry)	5 bous - 5015 bendown to a 150 god worth	buys Bentonthe + 150 gal	0	same (Reached Sur Face (2000)		22 11-24-14 100 to Hard Norobes to		1 1	5 Sign									78 Bass Brahonth gal	
502-		Tagged Bottom of Depth (feet)	220	222	160	Og Og	0			1	1									Cement,	
28681-20J		Tagged Depth (feet)				\			290	)	0									40 Bugs	
Project No.:	Dales.	Calculated Depth (feet)	103,9	54.7	13.5	- 1	- 76.9			80	/									chys ,	
		Total Vol. Installed (ft³)	247.1	270.6	294.1	317.6	341.1			343.2	388.2									See Sond to	
15:00	0	Volume Bag(s) or (ft³)	23.5	23.5	23.52	23.8	23.5			17	45									Bags	
Excelsion	202	Weight of Sand (lbs.)								1	4500									9	
Project:	veil ID.	>	>	>	_	7	/			7	7					-					
		Super Sk. or Batch	0		17	13	7			_	77									Notes:	

#### PIPE TALLY 8" Casing

Project Name.: FXCELSIOR	Project No.: 38681
Well No.: NSH-O16	Date: 11 - 16 - 14
Location: NSH-CL	Pipe Talley for: Cas, ~ (8")
Total Depth: 579'	Geologist: KENDRY FORD

D:		1	Length Σ	D: T		Disco		Lamada	Length Σ	Dina Tima
Pipe	1	Length		Pipe T	ype	Pipe	1	Length		Pipe Type
		(ft)	(ft)	134 04				(ft)	(ft)	
1	V	20.13	20.13	8" CAE	NY					
2	_/	20:13	40.26	1						
3		20.14	60,40							
4	_/	20.13	80.53							
5	1/	20.13	100,66							
6	V	20.13	120.79							
7	V	20,14	140.93							
8	V	20.13	161.06							
9	V	20.12	157.18							
10	V	20.12	201.30							
- 11	<u> </u>	2013	221.43							
12	<b>√</b> ′	20.13	241.56							
13	<u> </u>	20.12	261-68							=
14	<b>_</b>	20.12	281.80							
1.5	~	20.13	301.93							
16	V,	20-12	322.05							
17	V	20-12	342.17							
18	$\sqrt{}$	20,13	362.30							
19	<b>✓</b>	20.11	382.41							
20	V	20.12	402.53							
21	<b>V</b>	20.14	422.67							
22	V.	20.14	442.81							
23	7	20.12	462.93							
24	V	20.14	483.07					SUMN	IARY OF TALI	Υ ,
26	V	20.11	503.18			Total Le	ngth tal	llied:	<i>5</i> 83	7
26	N	20.10	523.28			Casing	_		0	
27	V	20.13	543.41	j		Length	of Casin	g Cut-Off:	4.3	
28	V	20.13	563.54	,		Bottom		_	579	
29		20.13		V		Screene	ed Interv	/al:	T <sub>em</sub>	
,			583.67	579.4	2	Total So			4	

Notes:

29 Jointy	of casing brought to site, = 580 ft Totalling, 583.67
	4.28' of font above tol of swar casher
	4.28' at fout above top of surher casing
	THE COMPANY OF THE CO

Staff: KENINGA FORD, KYLE MOHR 12-7-14, 12-17-14	19 feet Rat Hole Volume: 72.5 Ft <sup>3</sup> co.66 Ft <sup>3</sup> /Lin. Ft	Borehole Diameter [D]: Annular Volume per Linear Foot: (interval)  // Sa Ft/Ft 757-759  // Sa inches 0.08 Ft/Ft 0-61  // S.S inches 0.75 Ft/Ft 0-61	Annular Material Description (including number of bags & bag weight and batch mix and density for slurry)	14-INCH × No. 8 TAYNA FILTON PACK								(NYTHUNG USING SIGHT BUCKETS		$\wedge$	Total Bags of Cement:	Total Bags of Bentonite Gel: $\angle$ 09	Total Bags of Bentonite Chips: Z/	Total Bags of Transition Sand:	Total Super Sacks of Filter Pack:
e 11-	thole: ume per foot:		Bottom of Tremie (feet)	1173	11.33	1093	1093	1053	1013	973	973	913	913	913					
38681	Length of Rathole: Rat Hole Volume per foot:	oot: (interval)	Tagged Depth (feet)		J	ſ	1	1	1	)	940	936	930,5	929	d²) x 0.005454				:
Project No.: <i>3869</i> ) Dates: /2-5	feet inches	Annular Volume per Linear Foot:  0.00 Ft/Ft	Calculated Depth (feet)	1163	1139	1/25	8901	8001	996	286	526	h26	930	826	= ( D² -	ALL DEPTHS ARE FEET BELOW LAND SURFACE			કો
	//8/ feet 6.625 inches	Volume per Ft*/Ft Ft*/Ft Ft*/Ft	Total Vol. Installed (ft²)	20	30	36	00)	85	920	96	021	F.221	125.4	126,3	Annular volume cubic feet per linear foot	ELOW LAN	s = 0.7 Ft <sup>3</sup>	Density of sand and gravel = 100 lbs/Ft <sup>3</sup>	Full super sack (sk.) of filter pack is 30 Ft
510R	g Depth: neter [d]:	Annular Volume  0.66 FF/Ft  0,42 FF/Ft  0.55 FF/Ft  FF/Ft	Volume Bag(s) or Batch (ft³)	8	07	0	74	1251	10	9	42	2.7	42	0.0	cubic feet pe	RE FEET BI	ntonite chips	and gravel =	sk.) of filter
FXCA	Total Well/Casing Depth: Well/Casing Diameter [d]:	Borehole Diameter [D]:  // inches  // inches  inches inches	Weight of Sand Bag(s) (lbs.)	3000		3000		3000		3000		3000			lar volume	DEPTHS AF	50 lbs bag of bentonite chips = 0.7 Ft*	ity of sand	uper sack (
Project : Well ID:	Total Well/(	Borehole D	Super Sk. or Batch No.	>	>	N	>	W >	>	7 7	>	7	)	<u> </u>	Notes: Annu	ALL	9 09 IP	Dens	Full

ect: Dec 85/0R Project No.: 38681 Staff: KENDAA FOAD, KYLE MoutR IIID: NSH-017 Dates: 12-5-14 70 12-7-14, 12-17-14	Weight of Volume Total Vol. Calculated Tagged Sand Bag(s) or Installed Depth (feet) (feet) (flas) (ffeet) (flas) (ffeet) (flas) (ffeet) (flas) (ffeet) (flas) (flas	913 14-INCH x 1	No. 20-40 TRANS (720) SAND	516   518   618	26,2 162,3 871 - 893 GAMENT-BAUTHUTE GADUT	-10	794 - 833 1 (6 "	- FST 9.457	- 252 0	- 20512	- 570 1.382	- Ehg	V 20.1 325.4 614 - 733	345,5	7	7524 -	7 20,1 405,8 495 - 533	9 466 -	1 446.0 436 -	1466.1 40			
1 1 1			155	38																			
Project : Well ID:	Super Sk. or Batch	\ \ \	+	7	\ -		\(\int \)	M	7	\rangle \rangl		1	00	9	107	,	12/	13	7/	157	Notes:	-	=

FROM SULFARE 255KS 5 BABS GNOST + 140 DOUB (including number of bags & bag weight 3 BMS GROUTH KYLE MOHE and batch mix and density for slurry 13A65 2 BA65 GRANGE Annular Material Description 9 3/8-14CH PEA-GRANE TACNA 510 400VT CHIPS 12-17-14 Staff: Kowowa 12-10st x No. 8 BENTONITE 20 BENTONITE Bottom of 533 533 533 Tremie 533 (feet) 313 313 313 213 Dates: 12-5-14 ro Depth (feet) Project No.: *3869* Tagged 382 360 48 Calculated Depth 376 288 60 347 258 (feet) £18 4 710.6 566.6 486.2 506.3 546.5 586.7 596.9 Total Vol. 017. 743.6 Installed 598,2 044.6 526.4 (ff3) Bag(s) or (ff³) Volume 20.1 3 20.1 13 70.1 20,1 20.( Project: DX 5750R 7 3 3 33 33 N 37 M Well ID: NSH-017 Weight of Sand 3300 3300 3300 3750 3300 3300 3300 (lbs.) Super Sk. or Batch Notes: Q Q 1 N 10 2

940-1181

#### PIPE TALLY for 6" CASING

Project Name .: EXCELSIOR Project No.: 38681 Well Site: NSH-017 12-5-14 Date: Location: NSA - CK Staff: YENDRA FORD, KYLE MOHR

☐ Welded Type of Connections: ☐ T+C ☐ Flush Thread Other Lenath Length ∑ Length Length ∑ Pipe Pipe Type Pipe Pipe Type (ft) (ft) (ft) (ft) 20.06 20.06 lo" Screen 33 663.19 20.07 2 40-12 20.06 34 683.29 20.10 3 20.12 36 60-24 20.08 703.37 4 20.08 80.32 36 723.52 20.15 5 20.12 100.44 37 20.08 743.60 **V** 20.12 120.56 40 38 763.70 20.10 7 26.07 39 140.63 783.78 20.08 8 20.67 40 160.70 803.92 20.14 9 20.11 41 180.81 20.11 824.03 10 20.08 42 200,89 20.10 844.13 43 1.1 20.00 220.99 20.04 864.21 12 20.08 241.07 44 20.09 884.30 6" blank 261.18 45 13 20.11 904.42 20.12 46 14 20.11 281.29 20,08 924.50 15  $\checkmark$ 301.40 47 20.11 20.08 944.58 321.51 16 20.11 48 964.69 11.05 17 20.13 341.64 49 20.09 984.78 18 361.79 20.15 50 20.12 100 4.90 381.86 19 20.07 51 20.07 1024.97 20 401.99 52 20.13 20.12 1045.09 21 53 20.08 422.07 20.09 1065.18 442.17 22 20.10 54 20.08 1085.26 73 55 11.05 462.28 20.14 1105.40 24 20.10 462.38 56 20.08 1125.48 75 20.08 502.46 57 20.08 1145.56 26 20.11 522.57 **SUMMARY OF TALLY** Total length of casing/screen tallied (ft.): 1185. 🕏 ′ 27 542.70 20,13 28 20.08 562.78 Length of casing cut off after landing (ft.): 5 💆 1180.81 29 20.09 582.87 Bottom of Casing (feet, bls): 5.0' 30 602.96

31

32

Hany off top of sure @ 940'

623.04

643.12

20.09

20.08

20.08

Total Screen 241.07 - Depth of 938.93 Most lower 1.07 to reach 940' Casing Diametr . 55' Cosing wall . 02'

Stick up (ft, als):

Screened Interval(s) (ft.bls):

Total feet of screen in hole (ft.): Z4//

PIPE TALLY for 6" CASING

III E TALLI TOT	
Project Name.: Exca 5/0R	Project No.: 3968
Well Site: NSH - 017	Date: 12-5-14
Location: NSH-CK	Staff: KENDRA FOUND, KYLE MOHR
Type of Connections:	☐ Flush Thread ☐ Other

туре	of Con	nections:	☐ Welded	T+C U	Flush	hread	U Othe		
Pipe	✓	Length (ft)	Length ∑ (ft)	Pipe Type	Pipe	1	Length (ft)	Length ∑ (ft)	Pipe Type
58 59		20.12	1165,68	6"BLANK					
59	V	20.12	1185.80	+					
							-		
								Δ.	
<u> </u>					<u> </u>				
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Page of 7

Staff: Sacon (ook, Chad Price	H-12-21 H-81-21	5,2। feet Rat Hole Volume: त्र,3 Ft foot: ०.५५ FtशLin. Ft	Borehole Diameter [D]: Annular Volume per Linear Foot: (interval)    11.5   inches	of Annular Material Description e (including number of bags & bag weight and batch mix and density for slurry )	Super Sack Y4" XNO.8 Tarm, Filler Pack			//			Partial Super Sach 14" x NO. a Targua Fifter Pach	9-5016 bags of NOZOXUO Transition Sand	1.50 16 bas OF NOZOXUV Transitions and to get 10 FT.	14-50 15 bas hale Plug	3-50 16 bags of hole Dlug	Total Bags of Cement:	Total Bags of Bentonite Gel:	Total Bags of Bentonite Chips: 17	Total Bags of Transition Sand: 10	Total Super Sacks of Filter Pack: 7 (8 Supo Sks +1/1)	(+ S 5KS)
но	17714	athole: lume per f		Bottom of Tremie (feet)	926	880	850	760	039	029	009	585	285	555	555						
78681-204	12/6/14: 12/7/14	Length of Rathole: Rat Hole Volume per foot:	(interval)	Tagged Depth (feet)	425		830	756		629	598.75	540	589	515	025	x 0.005454					
Project No.:	Dates:	feet inches $(\mathfrak{b}(\mathfrak{f}))$	Annular Volume per Linear Foot:  0,43 Ft*/Ft  0,44 Ft*/Ft  0,45 Ft*/Ft	Calculated Depth (feet)	b. 816	813,8	9.251	8.292	1. hb9	633.5	298.7	9.685	589	595	5 70		SURFACE			£1:	
		4.5	Volume per Ft*/Ft Ft*/Ft Ft*/Ft	Total Vol. Installed (ff³)	30	60	90	921	051	160	190.45	194,95	195,45	205,25	207,35	Annular volume cubic feet per linear foot = $(D^2 - d^2)$	FEET BELOW LAND	= 0.7 Ft³	Density of sand and gravel = 100 lbs/Ft	Full super sack (sk.) of filter pack is 30 Ft <sup>3</sup>	
	8)(8		Annular \ 0,28 0,43 0,43 0,44 0,55	Volume Bag(s) or Batch (ft³)	30	R	2	R	2	R	(6.45	4.5	5,	816	21	ubic feet pe	E FEET BE	50 lbs bag of bentonite chips = 0.7 Ft3	nd gravel =	k.) of filter	
Excelsior	NSH-018	Total Well/Casing Depth: Well/Casing Diameter [d]:	Borehole Diameter [D]:  Q, 5 inches  Q inches  Q inches  Inches	Weight of Sand Bag(s) (lbs.)	3000	3000	3000	7,000	2000	3000	5h.Oj	450	20	760	150	ar volume c	ALL DEPTHS ARE	bag of ben	ty of sand a	per sack (s	
Project :	Well ID:	Total \	(0,5)	>	>	>	>	>	>	>	>	>	>	>	Λ	Annuk	ALL D	50 lbs	Densi	Full su	
P.	<b>&gt;</b>		Boreho	Super Sk. or Batch No.	_	7	2	5	N	0	7		7	_	4	Notes:					

Page \_\_\_\_ of \_\_\_

Staff: JCook, C(Arcon	H-12-21 H-87-21, HQ-6-2	Annular Material Description (including number of bags & bag weight and batch mix and density for slurry )	5.5 bess of hole Plug (12-13-14)	cks of Fill 91	Z-Z/ NO SKS (1) YZ												
	-h192-	Tagged Bottom of Depth (feet)	1	1	,												
18988	9.21	Tagged Depth (feet)	)	)	0												
Project No∴	Dates:	Calculated Depth (feet)	695	217	112												
		Total Vol. Installed (ft³)	211.2	443.7	893.7												
	/SH-018	Volume Bag(s) or (ft³)	3.85	232.5	450						:						
18985	NSK.	Weight of Sand (Ibs.)	275	23250	4500												
Project :	Well ID:	>			>					ľ							
Prc	Ň	Super Sk. or Batch	W	21.7-1	1/										Notes:	-	 _

#### PIPETALLY for Casina & Screen

Project Name.: Fx(e)5101	Project No.: 33681
Well Site: NSH-018	Date: 12-7-14
Location: PSH-CV	Staff: I cook, C. Price

□ Other ☑ Welded ☐ T+C Flush Thread **Type of Connections:** Length  $\Sigma$ Length ∑ Length Length 1 **Pipe** 1 Pipe Type Pipe Type Pipe (ft) (ft) (ft) (ft) 4" Scien 33 4/1 (45/45 20.09 20,09 662.72 34  $\checkmark$ 20,06 682.78 2 20.11 40,20 3 35 702.87 20.06 60,26 20,09 36 20,07 722,94 80.35 20,09 37 5 743,00 100.50 20,06 20.15 6 763,03 38 20,06 120,56 20.03 34 140.69 783.11 20,13 20,03 40 160.76 20,67 803.18 20:07 180.86 41 823,27 4 20.10 20.09 42 843.34 20.07 20.11 200.47 43 J 863.42 20.12 221.09 V 20.08 883.54 44 12 20.06 241,15 20:12 1/5 903,60 13 261,28 1 20.13 20.06 46 14 973.63 20.11 281.39 V 20.03 15 20.03 301,47 47 20,12 943,75 321,59 48 20,12 20.14 963.89 16 49 983.95 341.65 20.06 20,06 20 18 20,05 361.70 20,04 1003.99 381.79 20:09 411 145119 20,06 401.85 40 20,07 421,42 2/ 441.47 22 20,05 20,07 462.04 73 24 20,07 482.11 502.14 25 20,03 26 522.20 **SUMMARY OF TALLY** 20.06 27 Total length of casing/screen tallied (ft.): 1004 542,30 20,10 28 20:03 562,33 Length of casing cut off after landing (ft.): 992 79 20,06 582,39 Bottom of Casing (feet, bls): 30 20,08 602,47 Stick up (ft, als): Screened Interval(s) (ft.bls): 600-992 622.55 31 20.08 642,63 32 20,08 Total feet of screen in hole (ft.):

Notes:
Bull wase stua 0.21

12.7' Stitle up to land screen of \$610

Page of Z

### **ANNULAR MATERIAL RECORD**

Staff: KENDRA FORD 2-21-14	ot: feet Rat Hole Volume: Ft	Borehole Diameter [D]: Annular Volume per Linear Foot: (interval) inches Ft³/Ft inches Ft³/Ft inches Ft³/Ft	Annular Material Description (including number of bags & bag weight and batch mix and density for slurry)	5 bags besterite chips = 6.86 Ft -: se		35 bags court, I ben Quik Gel; 15 beng Caci 52.43 Ft 1750		5 bags Quik. Growt, 140 gal = 36.70 \$1 12					11	1,	Total Bags of Cement: 35	Total Bags of Bentonite Gel: 🔫 (ట్రాండ్ డాబ్డ్)	Total Bags of Bentonite Chips: 15	Total Bags of Transition Sand:	Total Super Sacks of Filter Pack: イヴ
	ithole: lume per fo		Bottom of Tremie (feet)	619.33		619.33		559.30	=		:	459.25	и	9.6					
3% 81-204 12-9-14	Length of Rathole: Rat Hole Volume per foot:	(interval)	Tagged Depth (feet)	l.		ŧ		•	\	A	•	•	-	·	x 0.005454				
Project No.: Dates:	feet inches	inear Foot: (ir 20 - 63g 54 0 - 20 FT	Calculated Depth (feet)	631.14		578.71		542.01	505.31	468.61	431.91	395.21	358.51	321.81		SURFACE			87
	63\$ feet \$ 5/8" inches	Annular Volume per Linear Foot:  0.51 Ft/Ft 20-63g  0.59 Ft/Ft 0-20  Ft/Ft Ft/Ft	Total Vol. Installed (ft³)	3.5		ht:92		18.71	37.42	56.13	74.84	93.55	92.211	130.97	Annular volume cubic feet per linear foot = $(D^2 - d^2)$	FEET BELOW LAND SURFACE	= 0.7 Ft³	Density of sand and gravel = 100 lbs/Ft	Full super sack (sk.) of filter pack is 30 Ft <sup>s</sup>
2/9	g Depth: leter [d]:	Annular 0.51	Volume Bag(s) or Batch (ft³)	3.5		76.34		18.71	18.11	18.71	18.71	18.71	18.71	18.71	ubic feet pe	E FEET BE	itonite chips	ind gravel =	sk.) of filter
6x ce 15:00	Total Well/Casing Depth: Well/Casing Diameter [d]:	Borehole Diameter [D]:  13 " inches  /3.5 inches inches	Weight of Sand Bag(s) (lbs.)												ar volume c	ALL DEPTHS ARE	50 lbs bag of bentonite chips = 0.7 Ft*	ty of sand a	uper sack (
Project : Well ID:	Total Well/C	rehole Di 13 " (3.5	>	>	_)	>		>	>	>	>	>	>	>	l	ALL [	50 lbs	Densi	Fulls
u >		Bore /	Super Sk. or Batch No.	_	1		.\	_	2	3	ナ	8	ڡ	1-	Notes:				

33

Pr	Project :	EXCELSIOR	OR		Project No.:	38681-204	405	Staff: KENDRA FORD
Š	Well ID:	NSH -019	6		Dates:	11-6-21		h1-12-2
Super Sk. or Batch	>	Weight of Sand (lbs.)	Volume Bag(s) or (ft³)	Total Vol. Installed (ft²)	Calculated Depth (feet)	Tagged Depth (feet)	Bottom of Tremie (feet)	Annular Material Description (including number of bags & bag weight and batch mix and density for slurry )
8	1		18.71	149.68	188.11	4	459.25	5 to ag ( Quik-Growt, 140 gal -> 36.70 St rige
٥	1		11	168.39	14.842	,	359.20	12
10	>		11	184.1	14:112	,	+	
	1		11	18.205	175.01	4	11	
21	/		11	25.422	138.31	z	19.03	
13	7		11	243.23	101.61		15	
H	>	1		74.192	64.91	- 00'0		" GROUT TO SURFACE
1	7	500	7	258,94	5	•		10 bags of hole Plag (12-21-2014)
~	7	13500	135	boh	+213	Surface		Super Sks !
			Ÿ					
,						. (		, and the second
				9				
Notes:								
				:				

#### PIPE TALLY 8" Casing

Project Name.: Excelsion	Project No.: 38681 - 204	
Well No.: NS 14-019	Date: 12-9-14	
Location: NSH-DA	Pipe Talley for: 8" Casma	
Total Depth: 638 RECT	Geologist: Kike moh	

Type of Connections: Welded T+C Flush Thread Other

Pipe		Length	Length ∑	Pipe Type	Pipe		Length	Length ∑	Pipe Type					
	1	(ft)	(ft)			1	(ft)	(ft)						
1	V	20.12	20.12	8' Casing	31	V	20.14	624.15	8"casing					
2	~	20.14	40.26	10	32	/	20.11	644, 26	11					
3		20.15	60.41											
4	V	20.13	80.54											
5	V	20.14	100.68											
6	V	20.14	120-82											
7	V	20.14	140.96											
8		20.14	161.10											
9	V	20.13	181.23											
10	V	20.14	201.37											
11		20.13	221,50											
12	V	20.13	241.63											
13	V	20.13	261.76											
14	V	20.13	281.89											
15	V	20.13	302.02											
16	~	20.15	322.17											
17		20.13	342,3			0.0								
18		20.13	362.43				40							
19	V	20.14	382.57											
20	2	20.12	402.69		1 - 3-									
21	1	20.14	422.83											
22	V	20.13	442.96											
23	V	20.13	463.09											
24	~	20.13	483.22				SUMN	MARY OF TALL	Y					
25		20.14	503.36		Total Le	ength tall	lied:	644.26						
26	V	20.13	523.49		Casing	Stick-Up	):	1.20'						
27		20.14	543.63		Length	of Casin	g Cut-Off:	5.02'						
28		20.14	563.77		Bottom	of Well:		638.04						
29	1	20.13	583.90		Screene	ed Interv	al:							
30	V	20.11	604.01		Total So	creen in	Hole:	-						

Notes: Casing Dramete -	85/8", LOW-CANBON SIGGE
Casm wall ~ 1/4"	
Cut off 5.02 fl	

Project No.: 38681 Staff: ∑COOK , C Price Dates: 12-17 +0 (2-20-2014 , 12-21-14	581.7 feet Length of Rathole:  3.,3 feet Rat Hole Volume: $7.0$ Ft <sup>2</sup> Lin. Ft $1.5^\circ$ oD inches Rat Hole Volume per foot: $0.53$ Ft <sup>2</sup> /Lin. Ft $10$ $\sim 1545$	Annular Volume per Linear Foot: (interval) Borehole Diameter [D]: Annular Volume per Linear Foot: (interval) inches		Jacus Filter pack,	158 1458 1450 1450 14"+ND. 8 Tuen Filter P K	5 68.5 1434 - 1415 IS Mas OF H	72,0 1476 1440Pt 1395 5 basé of hole Plus	73,4 1483' 1425 3 C plus	79,7 14(0 1406 Tomic	109,7 1725 - 1325 /c/x/10.8 Tach Fither Pack	139,7 AGH 1264 12,75 XI" x NO. 5 Tache Filter Parts.	162,2 21250 >1255 1735 12,11 x MO,8 Town Fil tel Pact	192,2 21250 71255 1235 W'40.8 Tawa Filter Pack	1401	Annular volume cubic feet per linear foot = $(D^2 - d^2) \times 0.005454$ Total Bags of Cement:	Total Bags of Bentonite Gel: 132	Total Bags of Bentonite Chips:	Fa Total Bags of Transition Sand:	ter pack is 30 Ft
Project No.	-11	lar Volume per Linear Foot  O י ל ב Ft*/Ft  South Ft*/Ft  O : ל א האיל היא האיל היא האיל האיל האיל הא	Total Vol. Installed (ft³)	0	5.8	5 68.5	0	73.4	79.7	109,7	7		4	6	et per linear foot = $(D^2 - d^2)$	T BELOW LAND SURFACE	hips = 0.7 Ft³	el = 100 lbs/Ft³	ter pack is 30 Ft
Project: Exce(ちいん) Well ID: 人/5代 02の	Total Well/Casing Depth: Well/Casing Diameter [d]:	Borehole Diameter [D]: Annu 9 7/8 inches	Weight of Volume Sand Bag(s) or Bag(s) (fbs.)	J 3000 30	1 2800 28	.01	1 750 3,5	7 100 114	(10000)	1 3000 70	_	1 2250 22,5	1 3000 30	J 3000 y	Annular volume cubic fee	ALL DEPTHS ARE FEET	50 lbs bag of bentonite chips = 0.7 Ft <sup>3</sup>	Density of sand and gravel = 100 lbs/Ft <sup>3</sup>	Full super sack (sk.) of filter pack is 30 Ft <sup>3</sup>
		BO 6 3 1	Super Sk. or Batch No.		ue	\$	7	M	7	(1)	7	Ŋ	Q	7	Notes:				

3 いい 780 3 330 GM 18171 100 Co 77/1/27 4 SARDNER SACKS 330 330 GM 1001 344 (including number of bags & bag weight 1106 06 グルが and batch mix and density for slurry 2 13445 1 San Z 2 5509 XX Annular Material Description 2 serly 15ags Da Sc 10 7995 ならな Dags 100 Jask ter 11405 CAPS Grande かられるいろ Filton CER Lovada 9 BUTMIX acha XX O CACL X BENTONTE Bowlow/te X Aug achor 2029 BENTANTO 3 GCNG のスナ ACNA tropo Cat 0 1,109/cm hole growt 0 CALCOLATED 20 Staff: A. 13 m<sub>E</sub> ) 14" × No. 8 5/ch3 0 2 2000 121/14 XNO 200 3/8-INCH 318-1NCH 0, 20 Bakkey page 5 0 0 1 56000 0 0 b 121 8 0 8 Depth (feet) Tremie (feet) 0901-000-760 190-1100 **Bottom of** 3 760-480 - Sai Face Sultain 1030 1040 V) ري 35 000 9 MN 100 1335 7 M 12-17-14 76 N 8681 2 Tagged Z 727 302 290 1053 050 035 126 Batches W Project No.: Dates: Calculated +97ax ~1050 2000 ~1750 050 0 120 ~1065 ~320 Depth ~340 (feet) 930 070 6 16 83 Q N 827.8 352.2 Total Vol. 466.6 978.5 Installed 8.226 10 212 19,918 £ 283 389 129 478, Slo. 252 15/ 39 0)-Bag(s) or Volume 264.6 150 2:0 (Hg 0.4 0 3 0 D 44. DM 0 7 NSH-020 0 Excelsion 12+25 44 M W M 7 1980 94 60 Weight of 350 441 30 gal 15,000 30901 330ga1 370gol 000 50 Sand 000 3000 3000 200 Spag 8 3000 (lbs.) 000 200 Project: Well ID: > Super Sk. or Batch 5 Jotes: 9 0 2 7

PIPE TALLY for 41/2 well casina

Project Name.: Excelsion Project No.: 38681

Well Site: NSH-020

Date: 12-16-14

Location: NSH-CX

Staff: L Price + Jason Coul

Type of Connections: Welded T+C Flush Thread Other

F			Length	Length Σ			Imeau	Longth							
	Pipe	1	(ft)	(ft)	Pipe Type	Pipe	1	Length (ft)	Length ∑ (ft)	Pipe Type					
		1	20.07	20.07	Soveen Flyg	33	V	20.11	642.29	Blank					
	2	/	20.09	40.16	Screen	39	/	20.07	662.36	13.5					
	3	V	20,09	60.25	screen	35	V	2008	682.44						
	H	1	20.11	80.36	screen	36	V	20.10	702.54	1					
T.	5	V	20,11	100,47	screen	37	1	20,12	722.66						
4	6		9.53	110,00	screen	38	1	20.07	742.73						
	7	1	20,06	130.06	Blan K	39	V	20.08	762.81						
	8		20.09	150,15	Blank.	40	V	20,09	782,90	1					
	9	"	20.11	170.26	Blank	41	V	20107	802,97						
	10	1	9.74	180.00	Blank:	42	1	20,08	823.05						
1	11	/	20,10	200,10	Screen	43	(/	20.09	843,14	<b>文 植 是</b>					
	12	1	20,10	220,20	Screen	44	J	20.07	863,21						
	13	V	20.14	240,34	screen	45		20.06	883.27						
	14	1	20.14	260.48	screen	46	V	20.07	903,34						
	15	1	20.12	280,60	screen	47	/	20,10	923.44						
	16	1	20.08	300.68	screen	48	V	20.07	943,51						
	17	V	20,13	320,81	screen	49	V	20,07	963.58						
	18	/	20,09	340,90	screen	50	1	20.09	983.67						
	19	1	20.10	361.00	Blank	51	1	20.07	1003,74						
	20	1	20.10	381.10	Blank	52		20,08	1023,82						
	21	V	20.10	401.20	Blank	53	/	20,06	1043,88						
	22	/	20,09	421.29	Sureen	54	/	20,06	1063,94						
	23	1	20.05	441.34	screen	55	V	20.07	1084.01						
	24	V	20.08	461,42	screen	56	V	2006	1104,09						
	25	/	20.09	481.51	Screen	57	V	20.13	1124,22						
	26	V	20.11	501.62	Screen			SUMMAR	RY OF TALLY						
	27	/	20,11	521.73	screen	Total ler	ngth of c	asing/scree	en tallied (ft.):	1585,93					
	28	1	20.10	541.83	Blank										
	29	V	20.06	561.89		Length of casing cut off after landing (ft.): 3.2  Bottom of Casing (feet, bls): 1582									
	30	V	20.13	582,02		Stick up (ft, als): ~ 1 \(\pi\)									
	31		20.07	602.09						402-1241:1181-1060					
	32	V	20.09	622.18					(ft.): 39x						

Notes:

4 1/2" OD LCS - ASTM AS3B

4" ID

Bull nose plug - 2 1/2"

Centralizers on Rine # 1 + # 6

4.20' stuck up needed @ landing

#### PIPE TALLY for 4/2 well casing

	3 (1)	
Project Name.: Excelsion	Project No.: 38681	
Well Site: NSII - 020	Date: 12-16-14	
Location: NSH-CX	Staff: L Price	

<b>Type of Connections:</b>		Welded		T+C		Flush Thread		Other
-----------------------------	--	--------	--	-----	--	--------------	--	-------

Pipe	1	Length (ft)	Length ∑ (ft)	Pipe Type	Pipe	<b>✓</b>	Length (ft)	Length ∑ (ft)	Pipe Type
58		20.08	1144,30	Blank					A BELLEVILLE
59	V	20.12	1164,42	1					
60	/	20.07	1184,49				1		
61	V	20.02	1204.51						
62	1/	20.02	1224.53						
63	Va		1244,62						
64	V	20,08	1264.70						
65	V	20.06	1284.76						
66	V	20,03	1304.79						
67	V	20.02	1324.91						
68			1344.99						
69	V	20,10.							
70	V	20.02	1385,11						
71	V	20.12							
72			1425,30						
73	V		1445.37						
74		20.08	1465.45						
75	V	20,09	1485,54						
76	7	20,08	1505.62						
77	V		1525.70						
78		20.07	1545.77						
79			1565,83						
80		20.10	1585,93						
							SUMMAR	Y OF TALLY	
					Total ler	ngth of c	casing/scree	n tallied (ft.):	
					Length o	of casing	g cut off afte	r landing (ft.):	
					Bottom o	of Casin	g (feet, bls)		
					Stick up	(ft, als)		4.2	
					Screene	d Interv	al(s) (ft.bls)		
					Total fee	et of scr	een in hole	(ft.):	

Notes:	joint	needs	4.20'	stick up	For 15	screened	interval
to hip	@ 10	60'		1			
ı							

#### Abendonment of NSH-021 b ANNOLA

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18.7 5. - 50 15 avick sel, 136 84,0 138 Sal +20 7 vick sel! 165 54 541, HS 420 Annular Volume per Linear Foot: (interval) C4125 891 16743 2-50 16 guick 3el 168 quick gel F (including number of bags & bag weight - 50 16 and batch mix and density for slurry) 李 Annular Material Description 2-50 13 3-50 16 Ft³/Ft Ft³/Ft Ft³/Ft Ft³/Ft <u>0</u> Rat Hole Volume: 21-47th coment 23-4716 coment 23-47 16 runne 23-47 B coment 23-47 B. comput 23-4(7 1/2 centent Staff: Judlan Midsen Total Super Sacks of Filter Pack: 24-47 15 22 -47 15 Total Bags of Bentonite Chips: Total Bags of Transition Sand: Total Bags of Bentonite Gel: Total Bags of Cement: Ft<sup>3</sup>/Lin. Ft Borehole Diameter [D]: inches inches inches inches feet cenent weight 13/5/1 12.7 15/ga 19.1 B/an 12.1 15/2 1 12/2/ 12.0 15/ なえ (1) 2 10 Rat Hole Volume per foot: Bottom of Tremie (feet) 213 1095 1095 895 125 Length of Rathole: lin 38681 Annular volume cubic feet per linear foot = (  $D^2$  -  $d^2$  ) x 0.005454 Annular Volume per Linear Foot: (interval) Tagged Depth (feet) Dates: 1/9//4 F2 (60) - (617) Project No.: ALL DEPTHS ARE FEET BELOW LAND SURFACE Calculated Depth (feet) 152 LL 8 785 10.6 inches BR <u>و</u> SHE 969 ZwO feet Full super sack (sk.) of filter pack is 30 Ft3 Density of sand and gravel = 100 lbs/Ft3 Total Vol. Installed 32.2 46.0 50 lbs bag of bentonite chips = 0.7 Ft 12.8 196,4 69.0 £ Ft³/Ft 223 Ft³/Ft Ft³/Ft Ft³/Ft Bag(s) or Volume 38.3 Batch (F) ろだっと 78.5 Well/Casing Diameter [d]: 32 Total Well/Casing Depth: 24.6 NSH-021 B 8 Excelsion Weight of Borehole Diameter [D]: Bag(s) Sand (Ibs.) inches inches inches inches Project: Well ID: Sk. or Batch Super Notes: 7 9 Š **6**0

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Page

Staff: KENDRA FORD, KYLE MOHR	-18-14	feet Rat Hole Volume: Ft3/Lin. Ft	Borehole Diameter [D]: Annular Volume per Linear Foot: (interval) inches Ft³/Ft Ft³/Ft inches Ft³/Ft Ft³/Ft	Annular Material Description (including number of bags & bag weight and batch mix and density for slurry )	S bags have plug (inside casing)		38 bags concert 1.5 bags Call, 140 gal water	· total volume ~210 gas (21 inches)	> 50.13 Ft vise		5 bong serboite get, 165 gas water -> 42.06 Ft of	)	"			Total Bags of Cement: 38	Total Bags of Bentonite Gel: 75	Total Bags of Bentonite Chips: 5	Total Bags of Transition Sand:	Total Super Sacks of Filter Pack:
	21	thole: ume per foot:	ш	Bottom of Tremie (feet)	,		599.43				539.40	11		479.37	11					
	STATES OF THE SE	Length of Rathole: Rat Hole Volume per foot:	t: (interval) 6าษ.ชา \$4	Tagged Depth (feet)	•						ţ		1		·	d <sup>2</sup> ) x 0.005454				
Project No.:	Dates:	feet inches	Annular Volume per Linear Foot:  O.S.6 Ft³/Ft Ft³/Ft Ft³/Ft Ft³/Ft	Calculated Depth (feet)	616.81		566.68				524.62	482.56	DHO.SD	348.44	356.38		D SURFACE			£ <del>1</del> :3
		8.5	/olume per Ft3/Ft Ft3/Ft Ft3/Ft	Total Vol. Installed (ft³)	3.5		10.82				9.82	7.44	40.8	94.4	811	er linear foo	ELOW LAN	: = 0.7 Ft <sup>3</sup>	100 lbs/Ft <sup>3</sup>	pack is 30 F
STOR	-0218	Depth: eter [d]:	Annular \ 0.56	Volume Bag(s) or Batch (ft³)	3.5		10.82				23.4	23.6	23.6	23.6	23.6	subic feet pe	R FEET B	tonite chips	ind gravel =	sk.) of filter
Excelsfor	NSH -	Total Well/Casing Depth: Well/Casing Diameter [d]:	Borehole Diameter [D]:  13 inches inches inches inches	Weight of Sand Bag(s) (lbs.)												Annular volume cubic feet per linear foot = $(D^2 -$	ALL DEPTHS ARE FEET BELOW LAND SURF,	50 lbs bag of bentonite chips = 0.7 Ft <sup>3</sup>	Density of sand and gravel = 100 lbs/Ft3	Full super sack (sk.) of filter pack is 30 Ft <sup>3</sup>
Project :	Well ID:	Total \	ehole Dia	> >	>	$\left  \cdot \right $	>		-	1	>	>	>	>	>	11		50 lbs	Densi	Fulls
			Bo	Super Sk. or Batch No.	_		-	-	>		-	7	~	7	8	Notes:	E			

Staff: KENDRA FORD, KYLE MOHR		Annular Material Description (including number of bags & bag weight and batch mix and density for slurry)	5 bagg hemite get 165 gat water; 42.06 ft rig	9		1.1	1.	11				" - only "4 batch pumped						268140na 1590 of 3304 Fts = 49.64ts will	plac Setice growthing began	2
	<b>T</b>	Bottom of Tremie (feet)	479.37	419.34	359.31	11	82.652	219.24	74.17	=	1)	**						not add	of Henie	
	41-81-21	Tagged Depth (feet)	,	,	١	•	1	í	`	·	٠	0						Have : it	pile	-
Project No.:	Dates:	Calculated Depth (feet)	314.32	275.26	230.20	188.14	146.08	104.02	61.96	19,9	-22.16							ms of	more batches	
		Total Vol. Installed (ft³)	141.6	165.20	188.8	P.212	236	259.6	283.2	306.8	330.4	354						٦,	7 ,0	
ioR	216	Volume Bag(s) or (ft³)	23.6	23.6	23.6	23.6	23,6	23.6	23.6	23.6	23.6	23.6						estimate: 14	( Rough	
Excelsion	NSH - 021 B	Weight of Sand (lbs.)																	الح الح	1 1
Project :	Well ID:	>	,	>	>	>	>	1	\	\	>	>							y h	
Pro	× —	Super Sk. or Batch	٥	1+	80	0	0	=	12	13	7	~						Notes:		

#### **PIPE TALLY**

Project Name.: Excelsion	Project No.: 38681-204	
Well No.: NS 4-0216	Date: 12-17-14	
Location: NSH-DB	Pipe Talley for: 8" casing	
Total Depth: (217 FOOT	Geologist: Myke Mohn, Kendra Ford	

Type of	Connecti	ons:	Welded 🔲	T+C U	Flush Th	read L	I Oth	er					
Pipe		Length	Length ∑	Pipe Type		Pipe		Length	Length ∑	Pipe Type			
	<b>V</b>	(ft)	(ft)				1	(ft)	(ft)				
ı	~	20.13	20.13	8"C	is.neg	31		20,12	624.04	8" csq			
۲	-	20.14	40.27							-			
3	/	20.12	60.39							-			
4		20.14	80.53										
5		20.14	100.67							-			
6	1	20.13	120.80										
7	<b>i</b> /	20.12	140.92										
8	1,	20.12	161.04										
ና	<b>J</b>	20.12	181.16					ļ					
10	✓.	20.13	201.29				,						
11	/	20.13	221.42										
12		20.13	241.55										
13 -	1	20.14	261.69										
14	1	70.13	281.82										
15	4	70.13	301.95										
16	<b>V</b>	20.14	322.09										
17	1	20.13	342:22										
18	1	20.13	362.35			<u> </u>							
19	<b>/</b>	20.13	382.48			<u> </u>							
7.0	1	20.13	402.61										
21	1	70.13	422.74										
22		20.13	442.87										
23	1	70,14	463.01										
24		20,14	483.15			1		SUMM	MARY OF TALL	Υ			
25	1	20.13	503.28			Total Le	ength ta	ıllied:	624.04				
26	1	20,13	523.41			Casing	Stick-U	p:	2.63				
27	1	20,14	543.55		Length of			ng Cut-Off:	4.60				
85		70.11	563.66	6			of Well	:	616.81				
29	V	20.13	583.79		/	Screen	ed Inter	val:					
30		20.13	603.92		Total S	creen ir	Hole:						

Notes:	8" Cas	ng >	8 5/8" dia	netv	1/4" Wall		
	(2))	8		16			
							-
		40.47	1077				
-						***************************************	
				<del></del>			Tild-

Page 2 of 7

### **ANNULAR MATERIAL RECORD**

19,3 lbs/gal (5BNSS 481+ (including number of bags & bag weight and batch mix and density for slurry) Annular Material Description ~150 gal WATEN V. NIGEON GOOUT BENTONTO Staff: 1-12-15 Depth (feet) Tremie (feet) Bottom of 259 259 651 339 59 0 9 P Dates: 1-11-15 Project No.: 3868 Tagged 3 Calculated Depth 232 (feet) 108 86/ 66. 25 0 Total Vol. 271.6 Installed 314.6 7286 336.1 293.1 207.1 250. (#3) Bag(s) or Well ID: N34-021C Volume 21.5 5.12 NIS 21.5 25 21.5 **BXCELSIOR** (F) Weight of Sand (Ibs.) ( 1 1 ( Project: 7 7 7 Sk. or Batch Notes: 3 00 2 1

#### PIPE TALLY 8" CASING

Project Name.: EXCELSIOR	Project No.: 38681	
Well No .: NSH - 021 C	Date: \ -    -  5	
Location: MS(+-DB	Pipe Talley for: 8" CASING	
Total Depth: 6 Z4	Geologist: KFORD	

Type of Connections: Welded T+C Flush Thread Other

Pipe		Length	Length Σ	Pipe Type	Pipe		Length	Length ∑	Pipe Type
	✓	(ft)	(ft)			✓	(ft)	(ft)	
1	/	20.12	20.12	8" Csq	31	~	20.03	623.73	8" csq
2	/	20.12	40.24	3	32	V	4.08	627.81	includes sticky
3	/	20.12	60.36				-		1
4	/	20,15	80.51						
5	/	20,12	100.63						
6	~	20,13	120.76						
7		20,13	140.89						
8	~	20.12	161-01						
9		20.12	181.13			N.			
10	~	20.12	201-25						
11	~	20.13	221.38						
12	V	20.14	241.52						
13	/	20.13	261.65						
14	/	20.12	281.77						
15	~	20.14	301.91						
16		20,11	322.02						
17	-	20.11	342-13						
18	~	20.12	362.25						
19	/	20,12	382.37						
20	~	20,13	402.50						
21	/	20.12	422.62						
22	~	20.12	442.74						
23	~	20.12	462.86						
24	7	20,11	482.97				SUMN	MARY OF TALL	·Y
25	V	20.12	503.09		Total Le	ngth ta	illied:	627.	8
26	~	20.12	523.21		Casing	Stick-U	p:	0	
27		20,12	543.33		Length	of Casi	ng Cut-Off:	3.8	
28	/	70.14	563.47		Bottom	of Well	:	624.8	2
29	~	70.14	583.61	( )	Screene	ed Inter	val:		
30	/	20,09	603.70	7	Total So	creen in	Hole:	_	

1-11-15 -	Brought over	loid out 3	1 joints 1	negured.	
A portion	of this joint	will be cut	04		 U

10×5016 BMS+-34000A 5×50 lb BAGS + ~ 170 GAL WATER BACOS + ~ 140 GAL WATOR (interval) 2201-8/01 319-339 8101.519 2010 BASS 338-613 铝 Annular Volume per Linear Foot: FLITBE PACK (including number of bags & bag weight and batch mix and density for slurry) Annular Material Description 1/2 N15150N TATONAL Ft³/Ft Ft³/Ft Ft³/Ft SILICA SPAND Rat Hole Volume: 4×5016 14-INCH X NO. 8 TACNA GEOST Total Super Sacks of Filter Pack: 0.63 0.61 Total Bags of Transition Sand: Total Bags of Bentonite Chips: Total Bags of Bentonite Gel: PRICE ANN. VOL Total Bags of Cement: 0.72 Ft3/Lin. Ft Borehole Diameter [D]: SANTON ITE inches inches inches inches No. 22 - 40 feet Staff: C 51-61-1 BH DIA 13.5 39 Rat Hole Volume per foot: ~ 1160,1120 1080, 1040 Bottom of 985 975 Tremie - 10 ZO 840 840 7/000 975 38 980 (feet) Dates: 1-18-15 to Length of Rathole: 1131-1170 ART HOLE Project No.: **3869** Annular volume cubic feet per linear foot = (  $D^2$  -  $d^2$  ) x 0.005454 **Tagged** 1037 Annular Volume per Linear Foot: (interval) 4101 466 Depth 1115 246 (feet) 989 66 630-1045 020-220 1045-1131 ALL DEPTHS ARE FEET BELOW LAND SURFACE Calculated 1055 980 7211 980 886 00/0/ Depth 206 989 (feet) 6.625 inches feet Full super sack (sk.) of filter pack is 30 Ft3 Density of sand and gravel = 100 lbs/Ft3 130.5 124.5 Total Vol. 30.0 135.5 20%0 228.5 **60.** € 120.0 Installed 8.0 184.4 50 lbs bag of bentonite chips = 0.7 Fta (£3) Ft³/Ft Ft³/Ft Ft³/Ft Ft³/Ft Bag(s) or 0.50 2.17 Volume 50 19.6 0.72 800 24.5 30.0 48.9 Batch 30.0 33.0 4.5 0,0 (ff3) Project: **もxcをようのR** N6H-022 Total Well/Casing Depth: Well/Casing Diameter [d]: Borehole Diameter [D]: Weight of 5000 Não 3000 3000 3000 8 3000 Sand Bag(s) (lbs.) inches inches inches inches ĺ Well ID: 2/2 Sk. or Batch Notes: Super 2 3 5 3 N

46-293 FT

293-319 FT

0.83

7

12.50

6 -5016 BAS+ -275 GAL 14-25 ~170 GM WATER 5×50/6 BAZS+ (including number of bags & bag weight and batch mix and density for slurry) NIGLSON Annular Material Description CEDUT Staff: C. Pece BENTONITE 51-61-Bottom of P 02h Tremie 780 720 250 360 660 720 360 099 000 80 540 490 (feet) 430 430 33 51-81-1 Depth (feet) 33368 Tagged Project No.: Dates: Calculated 588 547 707 417 628 306 387 427 Depth (feet) 449.0 547.0 Total Vol. 5.42h 498.0 5225 2775 687.0 326.5 3020 400.0 473.5 610,0 3510 375.5 571.5 648.5 Installed Bag(s) or 38.5 24.5 W.S 24.5 24.5 24.5 Volume 24.5 38.5 24.5 24.5 38.5 38.5 24.5 24.5 24.5 24.5 38.5 Project: EXCESSOR NSH-022 Weight of Sand (lbs.) 1 1 1 l Well ID: 7 7 7 Super Sk. or Batch Notes: 9 9 z $\mathscr{A}$ e 4 3 N O 9 7 0

PIPETALLY for Well Casing

Project Name.:	Excelsion	Project No.: 38 681
Well Site:	NSH-622	Date: 1/17/15
Location:	JS H-BF	Staff: T. Wielsen; C. Price

Type of Connections:	Z	Welded	T+C	Flush Thread	Other
The or commodition	-	**Oldod	1.0	i lasti i ili caa	Other

		Length	Length ∑	4 110 4			Length			
Pipe	<b>V</b>	(ft)	(ft)	Pipe Type	Pipe	<b>V</b>	(ft)	Length ∑ (ft)	Pipe Type	
1	1	0.25	0.25	Bull Nose Encl	33	/	20.09	643.34	Blank	
2		20.12	20.37	Screen	34	/	20.14	663.48		
3	/	20.08	40.45	1	35	1	20.10	683.58		
4	/	20.12	60.57		36	/	20,09	703.67		
5		20.07	80.64		37	/	20.11	723.78		
6		20.12	100.76		38	/	20.11	743.89		
7	/	20.09	120.85		39	/	20.07	763.96		
8	/	20.09	140.94	Blank	40		20.09	784.05		
9	/	20.11	161,05	\	41	1	20-11	804.16		
10	/	20.08	181.13		42	/	20.14	824.30		
11	1	20.06	201.19	\	43	/	20.13	844.43		
12	/	20.10	221.29		44		20.11	864.54		
13		20.09	241.38		45	/	20.09	884.63		
14		20.09	261.47		460	V	20.09	904-72		
15		<i>2</i> 0. (/	281.68		47	/	2008	924.80		
10	1	<i>2</i> 0.08	301.66		48	/	20-09	944.89		
17		20.12	321.78		49	/	20.07	964.96		
18	/	20.04	341.82		50	1,	20.11	985.07		
19		20.08	361.90		57		20.11	1005-18		
20	/	20.13	382.03		52		20.57	1025-25		
21	/	20.12	402.15		53		20.09	1045.34		
22		20.13	422.28		64	/	20.08	1065.42		
23	/	20.12	442.40		55	/	20,10	1085.52		
24	/,	2009	462.5242		56	<b>V</b>	20.07	1105.59		
25	/	20.09	482.6158		57	<b>V</b>	20.08	1125.67	V //	
26	/	20.12	502.7570		58	<b>√</b>	<b>SUMMAI</b>	RY OF TALLY		
27	/	20,09	522.6279		Total le	ngth of	casing/scre	en tallied (ft.):	1145.75	
28	/	20.14	642.983		Length	of casin	g cut off aft	er landing (ft.):	12.60	
29	/	20.06	562 -299		Bottom	of Casir	ng (feet, bls	<b>)</b> :	1130,85	
30	/	20.06	583.6 <b>\$</b>		Stick up	(ft, als)	):	2,30		
31	/,	20.11	603.18	4	Screen	ed Interv	val(s) (ft.bls	):1130.85-	1010.00	
3-1	/	20.09	623.25	- N	(ft.): 120.8	.85				

Notes:

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US 68" OD; 66" ID

N

of

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(interval) Ft3 Annular Volume per Linear Foot: 11/96 (including number of bags & bag weight and batch mix and density for slurry) Annular Material Description 5009 Ft³/Ft Ft³/Ft Ft3/Ft Ft3/Ft Rat Hole Volume: 20 Total Super Sacks of Filter Pack: Total Bags of Bentonite Chips: Total Bags of Transition Sand: Total Bags of Bentonite Gel: Srow Total Bags of Cement: Ft³/Lin. Ft Borehole Diameter [D]: inches inches inches SED inches SWD feet Staff: N Rat Hole Volume per foot: Bottom of Tremie 620 (feet) Length of Rathole: 116/15 2868 Annular volume cubic feet per linear foot =  $(D^2 - d^2) \times 0.005454$ Tagged Depth Annular Volume per Linear Foot: (interval) (feet) Dates: Project No.: ALL DEPTHS ARE FEET BELOW LAND SURFACE Calculated Depth (feet) 8,625 inches feet Full super sack (sk.) of filter pack is 30 Ft<sup>3</sup> Density of sand and gravel = 100 lbs/Ft3 Total Vol. 2205 Installed 240.5 50 lbs bag of bentonite chips = 0.7 Ft<sup>3</sup> (H3) Ft³/Ft Ft³/Ft Ft³/Ft Ft3/Ft 0.52 Bag(s) or Volume Batch (H3) Total Well/Casing Depth: Well/Casing Diameter [d]: 9 Borehole Diameter [D]: Weight of Sand Bag(s) (Ibs.) inches inches inches inches Project: Sk. or Batch Super Notes: S d W

Kium Chibride:

Staff: P. L'OUJE		Annular Material Description (including number of bags & bag weight and batch mix and density for slurry)	7 mess Os : 9.6 /5/50/	7 165 la	10 ba 53 OK: 10 165 1501	5 bags QG: 9.3165 but	9 puss Of : 9.8 14 /201											
		Bottom of Tremie (feet)	380	280	0	0	0											
18681		Tagged Depth (feet)																
Project No.:		Calculated Depth (feet)	201	27	(12)	(55).	(6)											
		Total Vol. Installed (ft³)	285	30%	328	348	370											
202		Volume Bag(s) or (ft³)	21	18	33	00	20											
Excelsion	110	Weight of Sand (lbs.)	350	400	500	250	N50											
Project :	5	`	7	7	7	7	7											
<u>4</u> 8	:	Super Sk. or Batch	//	12	13	14	18									Notes:		

#### PIPE TALLY for 8" CASING

 Project Name.:
 Excelsion
 Project No.:
 3868 /

 Well Site:
 NSH-023
 Date:
 1/15/15

 Location:
 Staff:
 Description:

Тур	e of Con	nections:	Welded	T+C	Flush 1	Thread	☐ Othe	r	
Pipe	1	Length (ft)	Length ∑ (ft)	Pipe Type	Pipe	1	Length (ft)	Length ∑ (ft)	Pipe Type
/	1/	20,19	20.19	8" cosing					
2		20.11	40.3						
3	<b>V</b>	20,12	60.42						
Н	$\vee$	20.12	80.54						
5	V	20-13	100.67						
6	<u> </u>	20.13	120.8						
7	· //	20,14	140.94						
8	<b>/</b>	20,13	161.07						
9	V	20.13	181.2						
10	$\checkmark$	20,13	201-33						
11	1	20.19	221.52						
12	/	20.12	241.64						
13	<b>/</b>	20.19	261,83						
14	V	20.15	281.98						
15	V	20.13	302.11						
16	V	20,13	322.24						
17	$\sqrt{}$	20,12	342.36						
18	/	20.13	362.49						
19	1	20.13	382.62						
20	V/	20.14	402.76						
21	V/	20.12	422.88						
22	V/	20.13	443.01						
23	V/	20.12	463.13						
24	V /:	20.13	483.26						
25	V/	z0.12	503.38						
26	1	20.10	523.48 Euz Ea						
27	V /	20.1(	543.59						
29	V/	20.14	563.73		-				
2-	./	20.13	583.86						
31		20.14	604.00						
37	./	20.14	624.14						
30 31 32 33	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	20.12	644.27	1/					
	/	-16:71	647.68	cut off					7
		-2.30	645.38						
		2.0	512.00	NICE OI					\
		1976-5					- CANADA AND AND AND AND AND AND AND AND AN		

o, Page \ ANNULAR MATERIAL RECORD А Staff: 3868 Project No.:

25 14.6 lbs やけれてするの Annular Volume per Linear Foot: (interval) 計 SAMONEN (including number of bags & bag weight and batch mix and density for slurry) plus 2 buss Annular Material Description Story gart とって Total Bags of Bentonite Chips: lo bっ hっし Ft³/Ft Ft³/Ft Ft³/Ft Ft³/Ft Rat Hole Volume: Total Super Sacks of Filter Pack: ハbルビ Total Bags of Transition Sand: NONE Sby とくどナ 0.5 ben Litebras of 153 yr A (52 5m Total Bags of Bentonite Gel: Ft3/Lin. Ft Borehole Diameter [D]: Total Bags of Cement: inches inches inches inches feet 3 batches 3 battley ·8-15 280 0 5 2 Rat Hole Volume per foot: 1101 3 8 C 400 320 28 8700 Bottom of Tremie (feet) 400 300 000 000 740 Length of Rathole: 222 シーカノ Annular Volume per Linear Foot: (interval) Tagged Depth Annular volume cubic feet per linear foot = ( $D^2 - d^2$ ) x 0.005454 (feet) -62537 Dates: Calculated 3 ALL DEPTHS ARE FEET BELOW LAND SURFACE Depth C(feet) 8.ú% inches 2000 328 27.2 458 625.34 feet Full super sack (sk.) of filter pack is 30 Ft Total Vol. Installed Density of sand and gravel = 100 lbs/Ft なかり 50 lbs bag of bentonite chips = 0.7 Ft Ft³/Ft Ft³/Ft Ft³/Ft Ft³/Ft 5 25 S 715 (ft?) & 1 828.9 Bag(s) or 1001 Volume NSH-024 Batch 9~1=0.1334+3 Total Well/Casing Depth: アメルトング Well/Casing Diameter [d]: 40 5 90 60 Borehole Diameter [D]: Weight of Sand Bag(s) inches inches inches (Ibs.) inches 1645 3 500 200 250 750 Project: Well ID: Sk. or Batch Super S. Notes: 7 M J

2 Sny Caclz total boy and grant = 75

Page of 2

Staff. D. Hucke	1	Annular Material Description (including number of bags & bag weight		2 butches, reached 2	2-8-16 GOTAMATES TOP OF GLANT	AT ~109 FBGT	2 BESS TREES TO CHOS	200	n j						July 1			12 H2 O			
38681	12-1/2	Tagged Bottom of Depth (feet)	160	45 20			0				-	-						1500	)		
3868	1/19	Tagged Depth (feet)					601				-	P						grant &			
Project No.:	Dates:	Calculated Depth (feet)	142.8				1			-								5015 0			
		Total Vol. Installed (ft³)	235	315		37.0	2710											50101			
JAS	1024	Volume Bag(s) or (ft³)	70	40		2	i											2			
Excelsion	NSH	Weight of Sand (Ibs.)	500	Sho				4					and.					Batch			
Project :	Well ID:	`	A	>			<b>&gt;</b>							J /				7		1.5	
<u>a</u>	>	Super Sk. or Batch	4	8		-	- -											Notes:		4	

_	1		- 1
Page	- 1	of	'

PIPE TALLY for 8" casing

 Project Name.:
 Excelsion
 Project No.:
 3868 /

 Well Site:
 ## Date:
 1/19 / 15

 Location:
 Staff:
 ## Excelsion:

Type of Connections: Welded T+C Flush Thread Other

Pipe	1	Length	Length Σ	Pipe Type	Pipe	1	Length	Length ∑	Pipe Type
		(ft)	(ft)	A DAME TO THE REAL PROPERTY OF THE PARTY OF			(ft)	(ft)	
/	V	20.12	20.12	8" cos us	32		16.71	640.77	
2		20.11	40.23				-12.5	68.6282	- Cutott
3	V	20.14	60.37				-1.9	626.37	CATOFF
4	V	20.13	80.50						
5		20.14	100.64						
6	V	20.14	120,78						
7		20.13	140.91						
8	V	20.12	161.03						
9		20.14	181-17						
10	/	20.11	201.28						
11	/	20.12	221.40	and the second s					
12	V	20.14	241-54	Total Annual Ann					
13	/	20.12	261.66	No.					
14	V	20.14	281.80	To the state of th					
15		20.12	301.92						
16	V	20.13	322.05		<u> </u>				
17		20.14	342.19						
18	V	20.13	362-32	and the state of t					
19	/	20.14	382.46	and the second					
20	V	20.12	102.58		<u> </u>				
21	/	20.14	422.72	Openin - menon	<u> </u>				
22	V	20.13	442.85	a de la constante de la consta					
23		20.14	402.99	Wilder to Ju					V 1
24	V	20.14	493.13						
25	/	20.14	503.27				191100 544		
26		20.12	523,39				SUMMA	RY OF TALLY	640-77
27	/	20.14	543.53		Total le	ngth of	casing/scre	en tallied (ft.):	626.37
28	V	20.13	563.66		Length	of casir	ng cut off aft	er landing (ft.):	14.4
29	/	20.12	583.78		Bottom	of Casi	ng (feet, bls	s):	625.42
30	V	20.13	603.91		Stick up	o (ft, als	s):	0.95	
31	V	20.15	624.06		Screen	ed Inter	val(s) (ft.bls		
32		20.13	644.A				reen in hole		

Notes:				,				
	8"	5/20/	105 10	(7" casin	9 m 5	0	3	33.01
66	nft	total	(nom ral)	75/8"1	213 8/8	ID		
					- /	1515		
3	inrf	are a	ason sto	ekup = 0	.5 Pt.	asl_		
			9	8	•			

Page of

Staff: I, Cook, KFod	30 feet Rat Hole Volume: 222 Ft <sup>3</sup> O.54 Ft <sup>3</sup> /Lin. Ft Rat Hole flom ~1540 to 1560	Borehole Diameter [D]: Annular Volume per Linear Foot: (interval) ( $C$ inches 0,43 Ft²/Ft $SSD - 6SC$ $C$ inches 0,49 Ft²/Ft $CSCC - 6SC$ $C$ inches 0,49 Ft²/Ft $CSCC - CSC$ $C$ inches 0,55 Ft²/Ft $CSCC - CCC$	Annular Material Description (including number of bags & bag weight and batch mix and density for slurry )	5-50 LB Bays of Hole plug (clogged frame); 65 An	ole Plug (clogged tre		10×50 LB Bage 20×40 Silva Sand 13 Ft rive ( Hemi		11 Hemieta: 1586.5; wait 1 1568; wait 0.5 hr.	(2)		(1 x Swar Sache 1/4" & NOS TOCKA FILLET Pack	emil ~ 3/4 was though sae	sad budest Filter pack: ~ 26	Cement: ///	Total Bags of Bentonite Gel: 136 governance 14 Quill growt	,	Total Bags of Transition Sand: 寸為	Total Super Sacks of Filter Pack:
\$1.52-1	thole: ume per foot:		Bottom of Tremie (feet)	1580	1560		1560	1560	1560	1540		1520,	1480	1480					
38681	Length of Rathole: Rat Hole Volume per foot:	(interval) -30 -20 -20	Tagged Depth (feet)	NA	1595.5		1841	1589.5	15681	1559.51		(1515)		1475	x 0.005454				
Project No.: Dates:	feet inches	Annular Volume per Linear Foot: (0.43 Ft%/Ft 1220-122 0.43 Ft%/Ft 1220-845 0.43 Ft%/Ft 1220-845	Calculated Depth (feet)	1583.5	1581.6		1582,5	15,69.51	15\$6.5	1558		١	1495.9	1469.5	Annular volume cubic feet per linear foot = ( D² - d² )	ALL DEPTHS ARE FEET BELOW LAND SURFACE			:43
	1 % = S	/olume ber Ft³/Ft Ft³/Ft Ft³/Ft	Total Vol. Installed (ft³)	3,5	4.55		911	9.81	9.56	2115			€'h9	7.56	r linear foo	<b>ELOW LANI</b>	= 0.7 Ft <sup>3</sup>	100 lbs/Ft3	oack is 30 F
31	Depth: eter [d]: 4,	Annular V 0, 43 0, 43 0, 55 0, 43 0, 55	Volume Bag(s) or Batch (ft³)	3.5	1.05		7.0	4.0	J,0	5.6			33	11	ubic feet pe	E FEET BE	tonite chips	nd gravel =	ik.) of filter
3868   NSH-0	Total Well/Casing Depth: 1130 Well/Casing Diameter [d]: 4,570,0.	Borehole Diameter [D]:  ( O inches ( ) inches ( ) inches ( ) inches	Weight of Sand Bag(s) (lbs.)	250	75		500	200	500	400			3300	1100	ar volume c	<b>EPTHS AR</b>	50 lbs bag of bentonite chips = 0.7 Ft <sup>3</sup>	Density of sand and gravel = 100 lbs/Ft³	Full super sack (sk.) of filter pack is 30 Ft <sup>3</sup>
Project : Well ID:	Total V Well/C	hole Dia	`	>	>		>	>	>	>	1		>	>	Annul	ALL D	50 lbs	Densi	Full st
ھ ک		Borel 7	Super Sk. or Batch No.	-	2	(	_	7	3	ゴ	)	15		7	Notes:				

1568.

P.	Project :	38681	-		Project No.:	1 1		Staff. SCOOK, KFORD
>	Well ID:	NSH-025	225		Dates:	51-42-1	51-52-1	1-26-15
Super Sk. or Batch	>	Weight of Sand (lbs.)	Volume Bag(s) or (ft³)	Total Vol. Installed (ft³)	Calculated Depth (feet)	Tagged Depth (feet)	Bottom of Tremie (feet)	Annular Material Description (including number of bags & bag weight and batch mix and density for slurry)
3	>	200	7	77.2	1469.5	1469	1460	3 × 5 gal buckety Filter pack, ~ S.SI4 size
}	1				M			
N.	>	400	5.6	82.8	1456	7.1941	1440	8 x SD Ub bagg 20-40 Sound, 13 Pt of le
3	>	001	હ	84.8		1460	152	2x 5015 Bans of NO 20x40 Sand
-	7	000	45.7	127.5	1360.7 6	NA	MM	0% solids Ground and
7	>	901	427	1702	1261.4	NA VA	1340	Bathz. 8 bugs 36 solids Group and
n	>	904	42.7	212.9	(165	NA	1340	3
ħ	7	oah	42,7	255,6	9901	NA	1260	+ Batch 4, 8 Sags 30% solids Growth, 20
2	7	00h	42,7	298.3	967	NA	1240	30 % Solide Growt 1
0	>	02/3	42.7	341	898	1/14	1240	5 30 % 601, de Grout,
1	>	Coh	42,7	383.7	773	NA	1240	30 % Soline Grow 1
8	>	oah	インプノ	4.924	676	174	1160	Batch 8, 8 15495 30% Gold, Grand,
6	>	400	42,7	160,1	548	NA	1160	Grout Butung, 8 trag 30% Solid Growt, 300 gal water
10	>	40	427	8/118	511	NA	1080	(Jost Batchilo, 8 buge 30% said, Grat, 300, 1,01 water
زز	>	904	42,7	584.5	424	WA	080	25 30 % solids Gras, 300
21	2	87	427	2,7,7	337	NA	1080	Srout Batch 12, & tougs 30% solite Grant, 300 qu/ water
71	>	400	127	6366	250	SurFace	10.20	Great Bothy 13, 8 bags 30% Solids Grouf, 20 gal water
ž	>	400	42,7	9.289	167	-	0801	F Butch 14,8 5445 3
15	>	00/	427	7153	14			15, 8 Days 30% Solide Groat
16	>	8	47.7	168	Suche-0		10 26	Boston 16,8 Dens 2010 Solide Growt
	>	400	י, מלי	812.1	r 80	<b>\</b>	1080	Batch 17, 8 hour 30 10 bolis Grout;
Notes:		8	Batch	- 16 95	grout (al	lcalated	Mus	6
			17 &	18 22	ナラ	-	brand grown	٠,٢٠
		Datey 17		estimatel m	nd weigh	1	2	
		butch 18		estimated 1	mud me 19	Col 9.7	1	

Page 3 of S

Prc	Project :	roject: 3868			Project No.:	28681	31	Staff. J Cook K Ford
×	Well ID:	NS1.02S	520		Dates:	1-26-15	.(5	
Super Sk. or Batch	>	Weight of Sand (Ibs.)	Volume Bag(s) or (ft³)	Total Vol. Installed (ft³)	Calculated Depth (feet)	Tagged Depth (feet)	Tagged Bottom of Depth (feet)	Annular Material Description (including number of bags & bag weight and batch mix and density for slurry)
18	>	850	25	1.498	17/17	Surface	NA	12 bigs of Grond, Shok Rug. 300 gallons.
И	7	2000	30	11468		)	NA	Full super Such of 14" x NOB Tawa Filte Pack
Notes:								

#### PIPE TALLY for 4" CASING

Project Name: Excelsion

Well Site: NSH-025

Location: (ochise County 1Az

Project No.: 38691

Date: 1-24-15

Staff: Jason Cooke

Тур	e of Cor	nections:	☑ Welded	ОТ	+c 🗆	Flush	Thread	☐ Othe	r		
Pipe	1	Length (ft)	Length ∑ (ft)	Pipe	е Туре	Pipe	1	Length (ft)	Length ∑ (ft)	Pipe	Туре
1	1	10,56		4"56	Hed screen	37	V	20,08	734,17	4"0	lanh
2	~	20,12	30,68			38	V	20.12	754,29		
3	/	20.07	50.75			34	V	20:09	774,38		
4	1	20.11	70,86	,	1	46	V	20,10	794,48		
5	/	20,07	90.93	4" Bl	ank	41	-	20,09	814,57		
6	/	20.15	111,08			42	V	20.11	834,68		
7	/	20.07	131,15			43	V	20,07	854,75		
8	V	20.14	151.29			Чij	V	70.09	874,84		
9	V	20,23	171.52			45		20,10	894,94		
10	V	20,08	191.60			46	~	70.08	915,02		
11	1	20.16	211.76			47	V	20,08	935.10		
12		20,06	231,82			48	U	20,05	955,15		
13	1	20.07	251,89			49	U.	20,11	975,26		
14	1	20,12	272.01			50	1	20,06	995,32		
15	V	20.06	292,07			51	U	20,07	1015,39		
16	V	20.14	31221			52	V	20.07	1035,46		
17	V	20.08	332.29			53	U	20,04	1055,50		
18	1	20.18	352,47			54	U	20,11	1075,61		
19	J	2013	372.6		7	3	V	20,11	1095,72		
20	,	20,07	392.67			56	1	20,10	1115,82		
ય	1	20,06	412,73			57	1	20,08	1/35,90		
27	1	20,10	432,83			58		20,09	1155,99		
23	1	70,08	452.01			59	1	20,05	1176.04		
24	V	2008	472.49			60		20,09	1196,13		
25	1	20.10	493.09			61	1		1216,19		
26	/	20,08	513.17			62		20,06	1236.25		
27	/	20,07	533.24			63	U	20,15	1256,40		
78	V	20.09	553.33			64	U	20116	1276.56		
29	1	20,08				65	V	20,14	1296,70		
36	1	20,12	593.53			66	U	70,07	1316,77		
31	V	2011	613,64			67	V	20,09	1336,86		
32	1	2009	633,73			68	V	20,09	1356,95		
33	1	20112	653,85			69	v	20:04	1376,99,		
34	V	20,08	673,93			70	V.	70,07	1397,06		
	1	20.09	694,02			71	1	20.05	1417.11		
		20.07	714.09			72	V	20,08	1437,19		-57

### PIPE TALLY for 4" (ASING

Project Name.: EXCELSIOR	Project No.: 38681	
Well Site: NSH-025	Date: 1-24-15	
Location: NSH-DP	Staff: I Cook 1K Ford	

Type of Connections: Welded ☐ T+C ☐ Flush Thread Other Length Length  $\Sigma$ Length Length  $\Sigma$ Pipe Pipe Pipe Type Pipe Type (ft) (ft) (ft) (ft) 73 20,03 1457.22 4 Blank 1477.33 20,11 74 1497.35 75 20,02 1517,43 76 20.08 1537,49 77 20,06 1557,57 20,08 78 SUMMARY OF TALLY Total length of casing/screen tallied (ft.): 1557,57 Length of casing cut off after landing (ft.): 5,63 1550,96 Bottom of Casing (feet, bls): Stick up (ft, als): 408 Screened Interval(s) (ft.bls): 1550,86' to 1480' Total feet of screen in hole (ft.): 70.96 Notes: 6.71 Et Stick up Dulast Joint Ports top OF Screen at 1480

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(interval) 왌 1/81,0 Annular Volume per Linear Foot: (including number of bags & bag weight and batch mix and density for slurry) 10 Annular Material Description Ft³/Ft Ft³/Ft Ft³/Ft Ft³/Ft Rat Hole Volume: Total Super Sacks of Filter Pack: Total Bags of Bentonite Chips: Stant Prove PCO VI Total Bags of Bentonite Gel: Total Bags of Cement: Ft³/Lin. Ft Borehole Diameter [D]: inches inches inches inches feet Staff: 3-17-15 Rat Hole Volume per foot: Bottom of Tremie 340 (feet) 00 MAR 541 34 44 Length of Rathole: 1868 Annular volume cubic feet per linear foot =  $(D^2 - d^2) \times 0.005454$ Annular Volume per Linear Foot: (interval) Tagged Depth (feet) Project No.: Dates: ALL DEPTHS ARE FEET BELOW LAND SURFACE Calculated 500 Depth 6/2 (feet) 8.625 inches 625 feet Full super sack (sk.) of filter pack is 30 Ft3 Total Vol. Density of sand and gravel = 100 lbs/Ft3 Installed 220 50 lbs bag of bentonite chips = 0.7 Ft<sup>3</sup> (F) 27 Ft³/Ft Ft³/Ft QSZ FP/Ft 3.59 Ft\*/Ft Bag(s) or Volume Batch 28.5 Total Well/Casing Depth: Well/Casing Diameter [d]: (H) 0 d Weight of Borehole Diameter [D]: Bag(s) Sand 300 200 200 (Ibs.) 300 inches inches inches inches Project : Well ID: Sk. or Batch Notes: Š (X

160

Staff. P. Kroger	3-17-15		(0× 50/65 Brik Grant, 9.3/1/2/ gal	(0x50/4 RWY 6000 X; 9.4 (165/44)	6×90/65 Ruin Grout 9.3 (55/201)	CX50155 KVIX Stant 9.3 (155)GAY	EX 50/4, Quix 500mt 10.3 195/901	GNSUMS Quik Growt, 9,3 145 GW	C	3/17/15 6/10/1 STINGS TO -70 1-001	5 CARS (4 BYSS)	14×No. B TACNA GRANGE (1 FULL SK + ")CF	BANDWITE CHPS (1893)								
	15	Bottom of Tremie (feet)	340	Ope	140	140	061	MIA			١	\	)								
38631	1.25-	Tagged Depth (feet)									1	/	0								
Project No.:	Dates:	Calculated Depth (feet)	142	102	25	7	(43)	(88)	,		65	0	0								
		Total Vol. Installed	367.5	288.5	312	335.5	359	3625			395.2	431.3	431.0								
JB/0	26	Volume Bag(s) or	235	21	23.5	235	235	23.5			13.8	35	4.0								
Excelsion	7-HSM	Weight of Sand	200	300	300	300	300	300			1	3500	1								
Project :	Well ID:	>		, ;	1	1	1	7			>	>	>								
Pre	Š	Super Sk. or		2	1	/3	101	Ý			-	1	-	de e					Notos:	Notes	

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PIPE TALLY for 85/2 steel rasing

Project Name.: Example 25	Project No.: 3868/	77
Well Site: NSH-026	Date: 1/24/15	
Location:	Staff: PLYDALC	

Welded ☐ T+C Type of Connections: Flush Thread Other Length Length  $\Sigma$ Length Length ∑ Pipe Pipe Type Pipe Pipe Type (ft) (ft) (ft) (ft) 8 casing 20.12 20.12 627.19 2 -1.53 20.09 40.21 cutofi 3 625.66 20.14 60.35 4 80.48 20.13 100.6 5 20.12 20.11 120.71 10 7 140.85 2014 160.99 20.14 9 20.12 181.11 201.23 20.12 221.35 11 20.12 12 20.17 241.47 13 20.13 261.6 281.72 14 20.12 301.84 15 20.12 16 321.97 20.13 20.12 342.09 20.12 362.21 20.12 382,33 402.45 20 20-12 21 422.58 20.13 442.71 20.13 22 23 462.85 20.14 24 20.12 482,97 20.12 503.09 25 26 20.12 523.21 27 20 .12 543.33 28 20.11 563.44 201 20.13 583.57 30 20.13 603.7 623.18 31 20,11 12,52 + 21 13 reattaches -21,13 Cut off 32 20,13 643.31 -16,12 Cutoft **全人** 627.19

33 total on ste

Ā	Project :	EXCELSION	Sior		Project No.:	38681		Staff: KFORD, SLOOK, C. PITICE.
3	Well ID:	O- HSZ	+20-		Dates:	51-12-1	0 +0	51-1-7
	Total V	Total Well/Casing Depth: Well/Casing Diameter [d]:	Depth: eter [d]:	1010 feet 6,75 op inches	feet inches	Length of Rathole: Rat Hole Volume p	Length of Rathole: Rat Hole Volume per foot:	feet Rat Hole Volume: Ft <sup>3</sup> Ft <sup>3</sup> /Lin. Ft
Borehold   3   12.7   12.5   12.5	ehole Dia 13 12.75 13	Borehole Diameter [D]:   3 inches  12.45 inches  13 inches	Annular V 0.67 0.67 0.67 0.67	Volume per Ft*/Ft Ft*/Ft Ft*/Ft Ft*/Ft	Annular Volume per Linear Foot:  0,67 Ft³/Ft 980 - 8  0,67 Ft²/Ft 800 - 4  0,67 Ft²/Ft 800 - 4	180 800 400 420		Borehole Diameter [D]: Annular Volume per Linear Foot: (interval)  1 3 inches Ft³/Ft 420 - 0  inches Ft³/Ft
Super Sk. or Batch No.	`	Weight of Sand Bag(s) (lbs.)	Volume Bag(s) or Batch (ft³)	Total Vol. Installed (ft³)	Calculated Depth (feet)	Tagged Depth (feet)	Bottom of Tremie (feet)	Annular Material Description (including number of bags & bag weight and batch mix and density for slurry )
-	>	3000	30		978	79.75	960	Supersuck of Man NOS Taum Filt Pack
۲	>	1500	15	54,	455	05 bu	940	Partial super such 1/4" x NOS Tacha Filter Rock
2	>	2000	20	25	903	~903	900	Super Such of 4"x NOS Tuen Filter Price
h	>	3000	30	(00)	856	857	880-86	Š
S	>	200	5	110	850	850	840	9 bucket
1	>	400	h	61)	448	phon	840	8x5016 bess of No 20140 Sand.
7	1	250	3,5	116.5	845	843	840	5 x Sols buy of No 20x40 send.
2	>	052	5,5	119	839	2008	230	Solls has of No 20 MI
_	1	250	33.5	1525	778.	1	820	Group Butch 1, 5 bags of acoust, ~225 odlers of water
7	1	300	40.3	8'201	717	L	8300	~270 gallons
n	>	300	40,3	1.53.1	150	1	780	Grout Butch 3, 6 bass of grout, 270 gallers of water
Notes:	Annul	lar volume c	subic feet pe	er linear foc	Annular volume cubic feet per linear foot = ( D² - d² )	) x 0.005454		Total Bags of Cement:
	ALL D	DEPTHS AR	R FEET BI	ELOW LAN	ALL DEPTHS ARE FEET BELOW LAND SURFACE		3.	Total Bags of Bentonite Gel:
	50 lbs	50 lbs bag of bentonite chips = 0.7 Ft <sup>3</sup>	tonite chips	s = 0.7 Ft <sup>3</sup>				Total Bags of Bentonite Chips: 5
	Densi	Density of sand and gravel = 100 lbs/Ft3	and gravel =	= 100 lbs/Ft	8			Total Bags of Transition Sand: 18
	111111111111111111111111111111111111111	1 1000 200.	oly ) of filtor	Eill super sack (sk ) of filter nack is 30 Ft3	FF3	1		Total Super Sacks of Filter Pack: ~!>

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of growt, - 270 elations of water Butch 8,6 Says of group, ~ 270 9 allows of wealer Baking , 6 sugs of groul, ~ 270 gallons of water of mater -270 gallons of wated Grout Batch 18,8 bags of group, 2260 gullons of wald mout Botton 16 6 buys of month - 270 gallons of water ~270 gallons of water ofacout, ~270 gallons of water Butch S, 6 Sugs of grout, ~2.70 gullons of water Growt Butol 17 6 Days of growt, ~ 20 sallows of water ofgrout, 22 Bashows of water - 270 gallons of water 6 bagg ofgrowth 20 gallons of water Grout Batch 4,6 bags of growt, -270 gallons of water ~270 gallons of water Growth Baker 19,8 buss of grout, -260 nollars Full Super Sade 14" x NOS Tacna Fifty Place Filter Parch including number of bags & bag weight and batch mix and density for slurry Annular Material Description Pire Lacra acur Butch 7 , 6 buses of scout. Butch 14,6 hays of growth Butdy 6,6 bugs of grount, Butty 10 , 6 bers of ground Jose L. 5 x So bags of Hole Plug S Super Sack My XNOB 14" × NO8 Super Suck 1/4" XNUK & bugs Butch is 6 5005 Batch (1 6 bies Staff: K For & Full super such Batch 12 Butch 13 2-1-15 Stout よろっとり Growt からり Jrour J Tronk Troub. Stout Srowt TO TO Troop アルド Depth (feet) Tremie (feet) Bottom of Surface SylFace 4 540 200 340 780 NA 760 2007 2007 200 200 2007 079 XX 100 2007 580 -29-15 38681 130 1 1 Project No.: Dates: Calculated +322 +265 +330 Depth 583 (feet) 206 +35 + 443 450 +95 42/18 366 IN D 380 4488 326 80 25 155 434.6 Installed Total Vol 5'K/h 91976 9.968 h'9/9 9188 8,572 2,515 5,552 986.6 716,7 354 394, 636. 797 757 Bag(s) or (ft³) Volume 40,3 40,3 40,3 500 40.3 40,3 40,3 20. 9 40,3 40,3 40.3 40.3 40,3 700 EXCELSIOR 38 3 5 NSH-027 Weight of 300 3000 Sand 3000 300 (Ibs.) 3000 300 300 1500 300 38 300 300 38 38 300 2007 300 300 200 30 Project: Well ID: Sk. or Batch Notes: 81 90 2 7 0 5 3 17 0 0 J Q 9 7

Page S of 3

		tion ag weight · slurry )	Fiter Pack	F. Her Rack	Fisher Reve													
Staff. SCOOL	to 2-1-15	Annular Material Description (including number of bags & bag weight and batch mix and density for slurry)	Full super sack 14" + 100 g. Tagang Fit	SACK You & NO 8. Tache	Yyux Mas Bacon	Full Super Sack You KNOS Tacon Fitter												
	51-52-1	Tagged Bottom of Depth (feet)	NA	NA	NA	NA									3			
38681	2-1	Tagged Depth (feet)	-	1	1	Surface												
Project No.:	Dates:	Calculated Depth (feet)	58	01	45	150												
		Total Vol. Installed (ft³)	1016,6	919001	1076,6	11066												
Siol	SH-017	Volume Bag(s) or (ft³)	30	30	50	30												
Excelsion	NSH	Weight of Sand (lbs.)	3000	3000	3000	3000												
Project :	Well ID:	>	1	7	7	>												
Prc	×	Super Sk. or Batch	))	2)	13	101										Notes:		

### PIPE TALLY 6" CASING

Project Name.: EXCELSTOR	Project No.: 38681	
Well No .: NSH-027	Date: 1-29-15	
Location: NSH - BG	Pipe Talley for: 6" (ASING	
Total Depth:	Geologist:	

Type of Connections: Ma Welded T+C Tslush Thread Other

Pipe		Length	Length ∑	Pipe Type	Pipe		Length	Length ∑	Pipe Type
	1	(ft)	(ft)			<b>V</b>	(ft)	(ft)	
1		4,25		69screen	31	/	20.14	607.20	6" black
2	1	20:13	a4.38		32	1	20.08	627.28	
3	V	20.12	44.50		33	/	20/10	647.38	
4	/	20.13	64.63		34	/	20.08	667.46	
5	V	20:11	84.74		35	1	20.11	687.57	
6	V	20.06	104,80		36	1	20.13	707,70	1
7	V.	20,10	124.90		37	1,	20.08	727,78	
8	V	2010	145,00	×	38	/	20.08	747.86	- Dec
q	1	20.10	165,10	6"Blank	39	1	20.07	767.93	1 1
10	/	20.09	185,19		40	1/	20.06	787.99	
11	V	20.13	205,32		41	V	20.10	808.09	
12	1	20.09	225,41		42	1	20.09	828.18	
13	1	20:08		The state of the s	43	/	20.08	848.26	
14	V	2009	X65 ,58		44	/	20.07	868.33	
15	1/	20,09			45	/	20.08	888.41	
16	1	20,10	305.77		46	/	20.12	908.53	
17	V	20,01	325,78		47	/	20.12	928,65	
18	V,	20,13	345,91	-	48	V	20.08	948,73	
19	1	2008	365,99		49	1	20.15	968.88	
20	V	20,10	386,09		50	4	20.10	98898	
21	J	20,11	406,20		51	1	20.09		
22	V	20,10	426,30		52	/	4.14	1013.24	) 12
23	V	20,04	446.39						2012
24	5	20,12	466,51		1		SUMN	IARY OF TALL	
25	V	20,09	486,60		Total Le	ength tal	llied:	1013.2	-1
26	1	20.09	506.69		Casing	Stick-Up	p:	1.01	
17	V,	20,10	526,79		Length	of Casir	ng Cut-Off:	2.23	
28	1	20.09	546.88		Bottom	of Well:		1010.0	
29	/	20.09	566.97		Screened Interval: 865 - 1010				
30	/	20.09	587.06		Total S	creen in	Hole:	145	FF

Scicen.							
Casing	وإد	69/8° OP.	100	Carbon	Steel	0.250 wall	thick
100		4.15					_ 4

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age
Δ.

Staff: I Cook	oot: 0,92 Ft/Lin. Ft - Befer casing Install.	Borehole Diameter [D]: Annular Volume per Linear Foot: (interval) inches Ft³/Ft Ft²/Ft inches Ft³/Ft	Annular Material Description (including number of bags & bag weight and batch mix and density for slurry)	Ux So Lb. Hole Plug, Installed with asing off botton	32x4768 Porthal 1x50 to bengel, 2x Sollo cad, 2140 gallows water	Growt Batter, 6 x Soll Bugs Outh Groun, 140 sallows water	Front Bath 2, 6 x50 hb bags Own grant 140 sallors water	Grout Bakky3, 12x50 15 bags Quikgrout, 280 gallons water		Growt Bakes, 12 x5016 bags Quilingrout, -280 pullers cate	Trent Bath 6 12x Sollo bags Ruhyont 7280 gallons		12x Solly ways aughternorting so mellows	280 ordling	32	Total Bags of Bentonite Gel: 기 시	Total Bags of Bentonite Chips: 4	Total Bags of Transition Sand:	Total Super Sacks of Filter Pack: 7,5
8/ 5)	athole: dume per fo		Bottom of Tremie (feet)	520	520	37.	400	00h	360	760	360	160	091	art					i
38681	Length of Rathole: Rat Hole Volume per foot:	(interval) لاءدو	Tagged Depth (feet)	NA	1.	ı	1	}	)	,	,	)	1	>	) x 0.005454				
Project No.: Dates:	feet inches 00	Annular Volume per Linear Foot: (int	Calculated Depth (feet)	541	473	HAG	385	447	209	ાર્જો	33	+57	t 143	+23[	$= (D^2 - d^2)$	SURFACE			9.
	543.6	Volume per Ft³/Ft Ft³/Ft Ft³/Ft Ft³/Ft	Total Vol. installed (ft³)	2.8	28.2	6 1.1	24	129.8	175.6	4.166	267,2	313	8°85°E	404.6	Annular volume cubic feet per linear foot = ( $D^2 - d^2$	ALL DEPTHS ARE FEET BELOW LAND SURFAC	= 0.7 Ft <sup>3</sup>	100 lbs/Ft³	Full super sack (sk.) of filter pack is 30 Ft3
-028			Sag(s) or Batch (ft³)	8.8	35.4	नेअ.५	22-9	45.8	42.8	42,6	१४६	45.8	45.8	45.8	ubic feet pe	E FEET BE	tonite chips	ind gravel =	sk.) of filter
Excelsion NSH-028	Total Well/Casing Depth: Well/Casing Diameter [d]:	Borehole Diameter [D]:  ~ ( 3 inches inches inches inches	Weight of Sand Bag(s) (lbs.)	200	-(650	300	300	600	000	000	600	009	009	900	ar volume c	EPTHS AR	50 lbs bag of bentonite chips = 0.7 Ft <sup>3</sup>	Density of sand and gravel = 100 lbs/Ft <sup>3</sup>	uper sack (s
Project : Well ID:	Total Well/(	shole D	•	5	>	>	>	5	>	5	>	>	7		Annul	ALL E	50 lbs	Densi	Full s
ц >			Super Sk. or Batch No.	1	_	<sup>2</sup>	7	n	J.	n	9	, V	<b>5</b> 0	ゔ <sup>'</sup>	Notes:				

Page 2 of 2

### **ANNULAR MATERIAL RECORD**

Group Buffelo, 12x50 16 bays Ruitegrout, ~280 gullers water Grout Patch 11, 12x5015 Seas Quikyrout, ~280 gallows water FILE PECK Puck Pack Filhe Pack Filher Pack Filter Pach Pack -121-Fack 打什 上に下 とだけ (including number of bags & bag weight Filtz and batch mix and density for slurry) 20 Annular Material Description Tacus TacNa Tacha TACNA acra aena 14x NOS Jacon Fill saper such 4-18 NOB Tachy 14° × NO8 14 × NO8 1/2/8/108 12 KNO 8 MarNo8 1-1,8008 SS Such Such Full Super Sack Fill super sack Full Super San Full Super Such 2 Full Super Full Super 15 Sapar -28-K Staff: 1-31-15 Depth (feet) Tremie (feet) Bottom of 3 ort to 79 4 79 3 Na 3 7 7 -28-16 38681 SUFFE Tagged Sul Pare 3 B-S 330 2 SURPRO Project No.: Dates: Calculated Depth (feet) +550 +608 +376 +434 761 12 73h+ FROM 4 h 24 ゴ 20 F Installed 496.7 Total Vol 450.4 531,7 571,2 2115 2'109 7,127 7179 691.2 211/2 Dappe TACNA Bag(s) or (ft³) Volume 45,8 4 200 N5H-028 0 200 30 8 3 Exectsion Weight of 2000 Sand ASO OF (lbs.) 000 3000 3600 1500 3000 3000 3000 E 2000 Project: Well ID: > Sk. or Batch 0 Notes: Ņ 3

Page	1	of	1

### PIPE TALLY for 8" (ASING

Project Name .: EXCEUSIOR	Project No.: 38681	
Well Site: NSH-028	Date: 1-28-15	
Location: NSH - BH	Staff: K FORD 1 5 Cook	

Тур	e of Cor	nections:	■ Welded	☐ T+C ☐	Flush	Thread	☐ Othe	r	
Pipe	1	Length (ft)	Length ∑ (ft)	Pipe Type	Pipe	1	Length (ft)	Length ∑ (ft)	Pipe Type
j	/	19.94	19.94	8" casing					
2	/	19.90	39.84						
3	/	19.90	59.74						
4	~	19,95	7679.69						
5	/	19.88	99.57						
6	V	19,90	119.47						
7	/	19.81	139.28		20				
8	/	19.81	159.09						
9	V	19.80	178.89						
10	V	19.94	198.83						
11	V	20,08	218.91						
12	V	19,84	238.75						
13	V	19,83	258,58						
14	V	19,96	278.54						
15	V	14.75	298129						
16		19.76	318.05						
17	V	19.38	337,43						
18	V	20,09	357.52			1/			
19	-	20,00	37752			10			
70	/	1948	397.5						
21	V	19,76	417.26						
22	V	20,01	437.33	The:					
23	V	19,82	457,15		14				
24	1	19,84	476.99		128				
25	V	19.96	496,05						
26	V	20.06	517.01						
27		19,78	536,79			Y			
28	1	12.53	549.32	cut off					
			-4.81	4.81 Ft :	0.85	FLS	tickup		
			-0.85		1. 1				
				BET					
			543.66	Total len	gth	of	casing	in borel	o le
					100				
					130				
				10.157 238	11 2				

1-28-15: 30 joints of 8" brought to site (laid out i clearing on hill)

Staff: C. GARDNER	feet Rat Hole Volume: 0,2 Ft <sup>3</sup>	Borehole Diameter [D]: Annular Volume per Linear Foot: (interval)   Ft²/Ft   inches   inches   Ft²/Ft   inches   inches   inches   inches	Annular Material Description (including number of bags & bag weight and batch mix and density for slurry )	14-INCH × No. 8 TACNA FLIEN PACK		BENTONTO CHPS (6,50% BAS)	A GRAVITE 61/3 OF	No. 8 TACNA GRAUDIC	BA CARDEL /~		<b>→</b>			Total Bags of Cement:	Total Bags of Bentonite Gel:	Total Bags of Bentonite Chips:	Total Bags of Transition Sand:	Total Super Sacks of Filter Pack: ~   5K (~25 FT 3)
-75	Length of Rathole: Rat Hole Volume per foot: O.		Bottom of Tremie (feet)	190	578	0	0	0	0	0	0	1883						
Project No.: 38681 Dates: 1-29-	Length of Rathole: Rat Hole Volume p	i: (interval)	Tagged Depth (feet)	655	575			001		0/				k 0.005454				
Project No.: Dates:		Annular Volume per Linear Foot: 1,20 Ft/Ft 19-70 1,21 Ft/Ft 0-19 Ft/Ft Ft/Ft	Calculated Depth (feet)	099	580	554	36	-39	-89	-137	0,5			Annular volume cubic feet per linear foot = ( $D^2 - d^2$ ) x 0.005454	FEET BELOW LAND SURFACE			ફ
	709 feet <b>2</b> ,375 inches	Volume per Ft%Ft Ft%Ft Ft%Ft Ft%Ft	Total Vol. Installed (ft³)	0.01	25.0	2.62	132.8	147.8	157.8	167.3	169.8			r linear foot	LOW LAN	= 0.7 Ft³	100 lbs/Ft	ack is 30 F
510R	Depth: eter [d]:	Annular 0,20	Volume Bag(s) or Batch (ft³)	10.0	15.0	4.2	103.60	15,0	0,0	(0,0)	O N			abic feet pe		onite chips	id gravel =	c.) of filter p
FXLEISIOR NSH-029	Total Well/Casing Depth: Well/Casing Diameter [d]:	Borehole Diameter [D]:  (o / 2 inches  (o . 7 inches inches inches	Weight of Sand Bag(s) (Ibs.)	0.00/~	r 3000	ļ	10,360	2/200	000/	1000	200			r volume cu	ALL DEPTHS ARE	50 lbs bag of bentonite chips = 0.7 Ft*	Density of sand and gravel = 100 lbs/Ft	Full super sack (sk.) of filter pack is 30 Ft
Project : Well ID:	Total \	rehole Dia (6 / 2 / 6 / 7	)	7	>	>	7	>	>	>	>			Ι'	ALL DE	50 lbs	Density	Full su
		<u> </u>	Super Sk. or Batch No.	1	N			N	3	7	77			Notes:				

709,4

2.0

Screened Interval(s) (ft.bls): 604-709.4

Total feet of screen in hole (ft.): 105.5

### PIPETALLY for CASING & SCREEN

Project Name.: Excelsion Project No.: 38681

Well Site: NSH-029

Location: NSH-1000 Staff: C. Price, C. GARDNER

Flush Thread 

Other Type of Connections: ☐ Welded ☒ T+C ☐ Length  $\Sigma$ Length  $\Sigma$ Length Length Pipe Pipe Type Pipe Type Pipe (ft) (ft) (ft) (ft) 21.08 21.08 Slotte dunde 33 696.32 BLANK 21.10 34 21,10 717.48 到,42.16 Slotte d 21.08 Slotted 35 63,24 21.08 0 41 Slotted 84.37 105.53 Slotted 6 126.63 blank 147,72 blan K 168,85 0 21.08 189,93 211,03 21.10 10 232,15 11 253, 23 12 13 274,36 295,48 14 316.54 15 21.06 16 337,63 21.09 358,74 17 379.81 21.07 18 19 21.12 400,93 20 422.04 21.11 443.16 21 33 21.10 464.26 23 21,10 485.36 24 21.10 506.46 25 21.10 527.56 26 21.10 548. (do SUMMARY OF TALLY 27 Total length of casing/screen tallied (ft.): 717.5 21.12 569 FB 28 21.10 590,88 Length of casing cut off after landing (ft.): 6.1

Notes: 30 23/8" OD LLG SCH 40 BLACK PIPO, ASTM ASS
5 27/8" OD SIOTED LCS SCH 40 BLACK PIPO ASTM A-53
193- INCH WINE SLOTS MANDE WITH PLASMA CUTTOR

Bottom of Casing (feet, bls):

Stick up (ft, als):

29

30

31

32

V

21,10

21,10

21110

2110

633.08

65418

675.28

WITH 34 STS, TAGGGD BOTTOM W/ 7.1' STICKUP, TD BITE 710.38,

Page of

			(interval)						395	)										
Staff. C Price		34.5 feet Rat Hole Volume: 6-77 Ft <sup>3</sup>	Borehole Diameter [D]: Annular Volume per Linear Foot: inches Ft³/Ft inches Ft³/Ft inches Ft³/Ft	Annular Material Description (including number of bags & bag weight and batch mix and density for slurry )	Yy" x NO 8 Tacna	14" x NO 8 Tacha	14' × NO 8 Tacha	14" × NO 8 Tacha	6-5016 Bentowite Chip ba	7/8" Pea Gravel						Total Bags of Cement:	Total Bags of Bentonite Gel:	Total Bags of Bentonite Chips:	Total Bags of Transition Sand:	Total Super Sacks of Filter Pack:
	5	Length of Rathole: $34.5$ Rat Hole Volume per foot: $0.20$	m	Bottom of Tremie (feet)	625	583	583	€83	9	0	0	Q	Q	0	0					
139185	2-3-15	Length of Rathole: Rat Hole Volume p	ot: (interval) がも しつ	Tagged Depth (feet)	5	603	600	592	)	)		\	\	)	70	) x 0.005454				
Project No.:	Dates:	feet inches	Annular Volume per Linear Foot: (interval)  17 Ft³/Ft	Calculated Depth (feet)	625	583	580	590	267	m 450	350	350	150	50	- 50		D SURFACE			ફો
1	ı	705.5	Volume per Ft³/Ft Ft³/Ft Ft³/Ft Ft³/Ft	Total Vol. Installed (ft³)	20.4	27,6	31.5	33,2	374	57.4	77.4	47.4	117.4	137.4	157.4	Annular volume cubic feet per linear foot = $(D^2 - d^2)$	ALL DEPTHS ARE FEET BELOW LAND SURFAC	s = 0.7 Ft <sup>3</sup>	Density of sand and gravel = 100 lbs/Ft3	Full super sack (sk.) of filter pack is 30 Ft <sup>3</sup>
Sior	030		0 0 0	Pag(s) or Batch (ft³)	40.4	7.3	3.9	1.7	4,2	720	120	05	02	720	0000	cubic feet po	R FEET B	50 lbs bag of bentonite chips = 0.7 Ft3	and gravel =	sk.) of filter
Excelsion	N5 H -	Total Well/Casing Depth: Well/Casing Diameter [d]:	Borehole Diameter [D]:    C   inches     L 7   inches     L 7   inches     inches	Weight of Sand Bag(s) (lbs.)	2040	720	390	170	١	ì	١	,	1	1	)	ar volume	EPTHS AF	bag of ber	ty of sand	uper sack (
Project :	Well ID:	Total Well/C	ehole Di	>	>	>		>	>	<u>`</u>	>	>	>	.>	7	Annul	ALL E	50 lbs	Densi	Fulls
<u> </u>	>		Borel	Super Sk. or Batch No.	~	Ce	ĸ.	I			c	n	Z	12	9	Notes:				

Page 2 of 2

Staff: ( Drice			3/4" Pea grovel -to CEP.													
	5	Tagged Bottom of Depth (feet)	0												į.	:
. 38681	2-3-15	Tagged Depth (feet)	0													
Project No.:	Dates:	Calculated Depth (feet)	081				į									
		Total Vol. Installed (ft³)	177.4										i			
Siov	30	Volume Bag(s) or (ft³)	~30													
Excelsion	080-HEN	Weight of Sand (lbs.)	)													
Project :	Well ID:	>														
Prc	×	Super Sk. or Batch	7											Notes:		

### PIPE TALLY for CASING & SCHEEN

Project Name.: Excelsion

Well Site: NSH-030

Location: NSH-0DE

Project No.: 38681

Date: 2-3-15

Staff: ( Price

Тур	e of Cor	nections:	☐ Welded	<b>□</b> T	+c □	Flush	Thread	☐ Othe	r	
Pipe	1	Length (ft)	Length ∑ (ft)		Туре	Pipe	1	Length (ft)	Length ∑ (ft)	Pipe Type
ſ	<b>\</b>	21.1	21.1	Screen C	CAD	33	J,	21.1	696.3	Blank
2	$\checkmark$	21.1	142.2	Scien	, n .	34	V	21.1	717.4	l
3	ν,	21./	63.3	SULE						
Н	1	21.1	84.4	site	en.					
5	✓	21.1	105.5	Scre						
6	$\sqrt{}$	21.1	126.6	Blar	1 K					
7	<b>√</b>	21.1	147.7	Blav	1K					
8	·V	21.1	168.8	1						
9	V	21.1	189.9							
10	✓	31.1	211.0							
11	√,	31.1	2321							
12	<u> </u>	21.1	253,2							
13	<u> </u>	21-1	274.3							
14	<b>√</b>	21.1	295,4							
15	√,	21.1	316.5							
16	V,	31.1	337.6							
17	<b>√</b> ,	21.1	358.7							
18	V,	31.1	379.8							
19	\ <u></u>	21.1	400,9							
20	<b>V</b>	21.1	422.0							
31	ν,	21.1	443.1							
22	ν,	21.1	464.2							
23	V,	21-1	485.3							
24	V,	21.1	506-4							
25		31.1	527.5							
26	V,	21.1	548,6			-			RY OF TALLY	
27	-\/-	21.1	569.7			1	•		en tallied (ft.):	
28	V,	21.1	590.8			1			er landing (ft.):	_
29 38	<b>√</b>	21.1	611.9	-		1		g (feet, bls		705.5
	V,	21.1	633.0			-	(ft, als)		114 2,0	
31	V	21.1	654.1						):705.5-	
32		31-1	675.2	1		Total fe	et of scr	een in hole	(ft.): 🛛 105	*2

otes:	Screened	j -	ASTM	A53	SCH 40	Black Pipe	1/8 wide slots
29	blank	-	ASTM	A53	SCH 40	Black Pipe	

Page / of

Staff: 6	oer foot: 0/4625 Ft³/Lin. Ft	Borehole Diameter [D]: Annular Volume per Linear Foot: (interval)	inches Ft <sup>3</sup> /Ft Ft <sup>3</sup> /Ft inches Ft <sup>3</sup> /Ft		)į	(feet) (feet) (including number or bags & bag weight and feet)	695 7/8 05 1 taches super sock	670 4 bays of bentonite chins	670 3-9416 Portleyd coment, 12,6 15/acil	~650 3-	650	650	650	650	567	567	567	Total Bags of Cement: 33	Total Bags of Bentonite Gel: 4り	Total Bags of Bentonite Chips: 4	Total Bags of Transition Sand:	Total Super Sacks of Filter Pack: $^{\prime}\mathcal{A}$		
2/5/11	Length of Rathole: Rat Hole Volume per foot:	1	coment		Tagged	(feet)	200	[			1	1		1	1	)	-	) x 0.005454						
oct No.: Dates:	feet I	Annular Volume per Linear Foot: (interval)	690-7	100	Calculated	(feet)	049	889	02.9	658	9119	633	029	809	5 45	583	576		D SURFACE	~25X		£.		
7	12/20	Volume per l	6495 Ft³/Ft 6495 Ft³/Ft Ft³/Ft			Installed (ft³)	36	38.8	30.31	32.82	34.83	36.84	38.85	40,86	413.87	44.88	46.801	Annular volume cubic feet per linear foot = ( $D^2$ - $d^2$	FEET BELOW LAND SURFAC	s = 0.7 Ft <sup>3</sup>	Density of sand and gravel = 100 lbs/Ft³	pack is 30 Ft <sup>3</sup>	7	
180-H9/N	ng Depth: meter [d]:	0	0.16485 Ft9/Ft 0,16495 Ft9/Ft Ft9/Ft		of Volume Bag(s) or		3	3.8	10,5~	N2.0!	20,0	~2,0 l	10.5x	~2.0i	10:62	10. Cr	19.01	cubic feet p	RE FEETE	50 lbs bag of bentonite chips = 0.7 Ft3	and gravel	(sk.) of filter	Ventron / GOD	
5 47H-C	Total Well/Casing Depth: Well/Casing Diameter [d]:	Borehole Diameter [D]:	inches inches		Weight of Sand	Bag(s) (lbs.)	2000			/	1	ļ	-	1	1		\	ular volume	ALL DEPTHS ARE	os bag of be	sity of sand	Full super sack (sk.)	77	
Project:	Tota Well/	Borehole [	00		Super Sk. or	Batch No.	>	/	>	න <	3	7	>	\   	7. 4	8	9 1	Notes: Ann	ALL	11 05	Den	Full	34	E L

Page 2 of 3

Staff: CHM) PRICE, 67F	12015	Annular Material Description (including number of bags & bag weight and batch mix and density for slurry)	3 94 16 Portlind coment		SWITCH TO 25X O ON TO	25% Bent	1 Sport Book + 24 SMC H2	1.5.1	12 11 12	n XSI	West to	M X5.1	9.5% u	1. 36.	1:5%	1 SK SEROUT WEN DE, GRANNIM BENTONITY + 249AL H			15%	1.5%	*	11 35	1.5K				
180	2/6/10	Bottom of Tremie (feet)	567	567	483	483	483	483	483	483	483	483	483	483	483	483	483	483	48%	483	483	484	484				30
8368	20	Tagged Depth (feet)				- Separate Company	1		-		)			ď	1	)	)			)		١					
Project No.:	Dates:	Calculated Depth (feet)	558	546 (	504	462	441	450	299	3 70	257	336	315	462	812	252	231	2-10	100	1688	147	120	105				
		Total Vol. Installed (ft³)	48.61	50.9	57,9	64.9	68.4	771.9	75.4	78.9	82.4	85,9	89,4	92,9	4.96	99,96	103,4	6.901	4110.4	113.9	117.4.	120,9	124.4	7 499			
	V.	Bag(s) or (ft³)	رد رو	2.0	J. O. £	7	3,5	3.5	12 To	2.5	3.5	in in	3.15	3.19	5.5	5.5	3.5	3,5	3.5	3,5	3.5	3.5	3.5				
		Weight of Sand (lbs.)																									
Project :	Well ID:	Super Sk. or Batch	> 01	11	7	13	14	15	0	1	<u>60</u>	7	20	2	27	23	24	42	26	27	28	167	36	Notes:			15
L			<u>.                                    </u>		N. W.	4	345	353		2		187		- £22											>	w	N.

Page 3 of 3

Staff: CAPE		Annular Material Description (including number of bags & bag weight and batch mix and density for slurry )	1 Staworwed geon, Beat. + 24 and +3		. W	(1)	11 - 7AS BUT INCONCLUSIVE	, 11	, 11		11	(1	17	11 Dull 2 STILLES		11		1/	11 POUL FINEL STICK TOTALS 45.	SPORTS BOW	3					
8	2/6/201	Bottom of Tremie (feet)	483	483	483	483	105	(0.5)	1013	1069	101	105	(06)	63	63	63	63	63	Ď,						181	
3800	2/6	Tagged Depth (feet)					001~							250		-		5		,			.11	i i		
Project No.:	Dates:	Calculated Depth	84	59.	42	12	0	0	0	0	9	0	Ó	0	0	0	0	0	0		**					
		Total Vol. Installed	127.9	131.4	134.9	(38.4	141.9	14514	148.9	152.4	15 5,9	139.4	162,9	1664	169,9	13.4	176,9	180.4	193,9				19th tough			
130	N94-02	Volume Bag(s) or (ft³)	3.5	3.5	3.5	3.9.	3.5	3.5.	12.9.	3,5	3.5	3,5	3,0	25	3.5	bre	3.5	3.9=	2.6				¥			
COMINNI SO	NSH	Weight of Sand (lbs.)																								
Project :	Well ID:	>				-							Server.	E. Sanggrana	D to the											
4	>	Super Sk. or Batch	75	28	38	34	25	30	42	28	R	8	7	42	63	44	40	40.	44	ŕ	,	,	,	Notes:		

Page \_\_\_/\_ of \_/\_\_\_

SIND BY Z LEFT PIPE TALLY for CASING & SCHOOL Project Name.: GUNNISON Project No.: 3808 Well Site: NSH-031 Date: 2/5/15 Location: NOT FREEWAY Staff:

Туре	of Cor	nnections:	☐ Welded	T+C 🚨	Flush 1	Thread	☐ Othe	r 23/80	0.21
Pipe	1	Length (ft)	Length $\Sigma$ (ft)	Pipe Type	Pipe	1	Length (ft)	Length ∑ (ft)	Pipe Type
1		21.15	21.15	Black	多升				1
2		20,95	42,10		38				
3		21.00	63.1		3/9				
A		21.11	89.21		HO				
5		21.17	105.38		#1				
6		21.20	126,56		1		21.02		Pert
7		21.15	147.71		3		21.15		4.
8		21.00	168.71		3		21.10	7	
9		20.90	189.61		4		21.12	84.35	
10		71.00	210,61						
11		71.07	231.63						
12	14	21.18	252.81		<u> </u>				
13		71.10	273.91						
14		21.00	294.91						
15		21.12	316.03						
16		21.10	337.13						
17		21.09	358,22						
18		7095	379.17	49.00	10			721-	-805
19		21.05	400.22					122.	806
20		21.11	421.33	T. Bye.	ļ			N-770	804
21		21.10	442,43				2.07	T STOCK	P
22		21.00	463,93		ļ				
13		21.12	484.55						
24		21.09	505.64						
257		21.08	576.72						
16		21.10	547.82		-				
77		20.95	568,77		<del> </del>				
7.9		21.13	589.90						
201		21.09	610.99						
30		21.10	636.05						
		21.08	653.17		-				
22		21.13	674.30						
33		20,90	695,20	700					
3K		20.98	716.18						
35		21.12	737.30		-				
			1				<u> </u>		

	3,14 Ft3	oer Linear Foot: (interval)	ription k bag weight for slurry )	7/2	sand, 4 50 15 beg	group had	l												
	Rat Hole Volume:	Annular Volume per Linear Foot:  Ft³/Ft  Ft³/Ft  Ft³/Ft  Ft³/Ft	Annular Material Description (including number of bags & bag weight and batch mix and density for slurry )	s swer sack	Silven	15016	_									Gel:	Chips:	Sand: 4	er Pack:
Staff: 677 (	/ 6 feet  9(2) Ft?/Lin. Ft	Borehole Diameter [D]: inches inches inches inches	Ar (includir and ba	-7/8 05 tacho	colorado Fine	14 gal worter		111	11		11	=		J <sub>1</sub>	Total Bags of Cement:	Total Bags of Bentonite Gel:	Total Bags of Bentonite Chips:	Total Bags of Transition Sand:	Total Super Sacks of Filter Pack:
101	Length of Rathole: Rat Hole Volume per foot: O.	1333	Bottom of Tremie (ifeet)	720-70	From 9 Wit	bos	605	605	605	605	605	605	609	520		'	,		
2800	Length of Rathole: Rat Hole Volume p	(interval)	Tagged Depth (feet)	70g	069	1	-	1	ŧ.	-	١		1	١	D <sup>2</sup> - d <sup>2</sup> ) x 0.005454		:		
Project No.: Dates:	feet inches	Annular Volume per Linear Foot:  14.85 Ft3/Ft 700 - 804  16.4.85 Ft3/Ft 0 - 690  16.4.85 Ft3/Ft D - 690	Calculated Depth (feet)	665	680	676	662	849	634	620	606	592	878	564	-	ALL DEPTHS ARE FEET BELOW LAND SURFACE			£ <del>]</del> .
1 1 1	13/10 July 2004	Volume per Ft³/Ft Ft³/Ft Ft³/Ft Ft³/Ft	Total Vol. installed (ft³)	-37	~2Q	8.18 K	33. H	35.6	37.8	20	43.2	भूभ भू	46.6	48.8	Annular volume cubic feet per linear foot =	ELOW LAN	s = 0.7 Ft <sup>3</sup>	= 100 lbs/Ft3	Full super sack (sk.) of filter pack is 30 Ft3
1032	ng Depth: meter [d]:	200	of Volume Bag(s) or Batch (ft³)	~27	Ŗ	(d	نو رو	- 4	Q Cé	رو د و	رو د ف	ત્ય હ	2.2	J. B.	cubic feet p	RE FEET B	ntonite chips	and gravel =	(sk.) of filter
II: Exulsian D: NSH-0	Total Well/Casing Depth: Well/Casing Diameter [d]:	Borehole Diameter [D]:    inches   inch	Weight of Sand Bag(s) (lbs.)	2000	300	1	1	1	)	1	ı	1	1		ular volume	DEPTHS A	50 lbs bag of bentonite chips = $0.7 \text{ Ft}^3$	Density of sand and gravel = 100 lbs/Ft3	super sack
Project : Well ID:	Tot	Borehole	Super Sk. or Batch No.	<b>ア</b>	>	>	4	2	メ	7	2	7	8	9	Notes: Ann	ALL	50 1	Den	Full

Page 2 of 5

Staff: C Drice		Annular Material Description (including number of bags & bag weight and batch mix and density for slurry )	14 gal water, 1-50 15 grout bag,																							
	-15	Bottom of Tremie (feet)	520	520	520	025	463	462	Egh	462	79h	462	395	395	395	395	395	395	395	395	395	395	395			
3808	01-2	Tagged Depth (feet)	l	-	1	1	1	١	ł	1	ſ	•	١	1	(	ī	ſ	-	ŧ	ſ	-	ı	ı			
Project No.:	Dates:	Calculated Depth (feet)	550	536	522	508	hbh	480	466	452	438	hzh	017	346	383	368	h58	340	326	312	398	784	270			
		Total Vol. Installed (ft³)	15	53.2	55.4	57.6	59.8	62	64,2	200,2	68.6	20.8	73	75.2	77.4	79.6	8.8	18	86.2	4,88	9.06	92.8	96			
Stor	250-	Volume   Bag(s) or   (ft³)	6.2	7	5	=	=	=	=	Ξ	~	=	=	=	=	ت	=	=	=	-	-	=	تد			
Excelsion	NSH	Weight of Sand (lbs.)	١	(	1	1	1	s	١	ſ	1	ı	١	1	ſ	1	1	<b>1</b>	ſ	1	l	١	1			
Project :	Well ID:	> 10 of	7	>	>	7		7	7	-	>	>	2	<b> </b>	7	7	- V	<del>ا</del>	7	7	-	7	7	1.5		
		Super Sk. or Batch	ō	=	3	3	7	15	9	5	12	16	2	5	દ	2	द	g	رج 2	77	78	らて	30	Notes:		

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treme give, covert seen a - HS who comming किन्द (including number of bags & bag weight and batch mix and density for slurry drovt Annular Material Description Nielser 20 Price water Staff: gar 10ge 7 **415**115 Bottom of Tremie (feet) 395 395 395 395 395 77 395 395 395 395 395 395 Dates: 72 -10-15 395 395 395 395 395 395 395 Depth (feet) Tagged 3868 1 } Project No.: Calculated Depth (feet) 228 200 242 256 716 180 58 130 77 123 ジン 88 74 60 2 1 7 0 Total Vol. Installed 132.41 1082 1303 103.8 13656 (38.3) 134.6 99.4 10.7 141.7 1010 112.6 8,521 97.3 14.8 133.6 (ff3) 11902 121.14 106 38 Bag(s) or (ft³) Volume 4,2 N5H-033 Excelsion \_ \_ سي سيم 5 --\_ Ξ = = Ξ ۲ = \_ = = = Weight of Sand (lbs.) ŧ ١ l 1 1 1 1 1 1 ١ 1 1 ) 1 Project: くて Well ID: Sk. or Batch 7 32 53 34 36 38 39 9 CH CH 43 H 49 2 35 37 3 45 24 H 才 1

Page 4 of 5

Staff: Staff:		Annular Material Description (including number of bags & bag weight and batch mix and density for slurry)	14 sal where 1-50 16 bog of growt																				<b>→</b>			
	13/	Bottom of Tremie (feet)	1-15	145	145	145	145	145	511	549	145	53	85	15 m	Sh sta	37 12	45	712	45	45	45	45	h2			
38651	9/10/	Tagged Depth (feet)	١	(	1	,	-	1	1	/	ı	ı	1	1	1	١	1	)	1	1	ı	1	1			
Project No.:	Dates:	Calculated Depth (feet)	٥	Q	0	0	0	(C)	0	0	0	0	Ð	0	0	0	9	P	9	۵	0	D	0			
		Total Vol. Installed (ft³)	143.4	42,5	147.8	0.031	152,2	r' h51	0,951	158.8	(6/3)	163.2	165.4	107.6	169,8	172.0	174.2	17.91	178,6	180,5	183.0	185.2	127.4			
Six	23.2	Volume Bag(s) or (ft³)	2,2	).	ت	11	11	))	>	1,1	¥	11	11	11	11	11	X	11	11	11	1.	1	16			
Excelsin	N514-032	Weight of Sand (lbs.)	١	1	1	1	1	)	)	J	1	)	)	ı	ı	١	1	1	1	١	1	1	١			E
Project :	Well ID:	>	>	>	>		2	1	>		>	>	>	1	/	\	>	/		>	>	>	>			<b>A</b>
Prc	We	Super Sk. or Batch	53	53	24	55	250	51	36	59	B	io i	29	63	اوح	S	alo	5.5	66	200	92	7	77	Notes:	•	•

Page 5 of 5

Staff: Thelian		Annular Material Description (including number of bags & bag weight and batch mix and density for slurry )	14 gal wher , 1 - 50 15 great big															
		Bottom of Tremie (feet)	45	45	46													
	(1) (a) (v)	Tagged Depth (feet)	١	•	t	1												
Project No.:	Dales.	Calculated Depth (feet)	۵	0	0	0												:
		Total Vol. Installed (ft³)	9.681	8 161	0. pp1	196-2												
Sich	7000	Volume Bag(s) or (ft³)	2.2	11	10	11						:						
Decelsion	A55(4	Weight of Sand (lbs.)	١	1	(	)												
Project:	well ID:	>																
		Super Sk. or Batch	73	74	52	27										Notes:		

Page \_\_\_\_ of \_\_\_ (

Shope 2 Laft

PIPE TALLY for CASING

Project No.:

Project Name.: Exulsion Well Site: Date: 2/1/15 Location: N. OC 1-10 Staff: GPF Type of Connections: 

Welded THE

1 3 1			☐ Welded				Thread	d 🔲 Other				
Pipe	1	Length (ft)	Length ∑ (ft)	Pipe	Э Туре	Pipe	1	Length (ft)	Length ∑ (ft)	Pipe Type		
		21.15	21.15	PEUF	23/9 00	37	21.09	774,04				
2		21.10	42.25	)1		38	21.12	8PD.16				
3		21.08	63.33	H		39	21.03	82.16	- and off	FORTHALL		
4		21.12	84.45	11				And in contrast of the last	STRING	15 8061		
6		20,99	105,40	Blune :	23/8" aD				1HC1. 5	An artist the state of the stat		
6		2113	126.53							receip.		
7		21.12	147.65									
8		21.09	168.74									
		21.10	189.84									
10		21.08	210,92									
/1		21.13	232.09					Sino	5N 72	7-804		
12		20.90	252.95						2. 4 7 00	001		
13		20.98	273,93									
14		20.73	294.86									
15		3/12	315,98									
16		21.09	337.07									
17		213	358.20									
18		21.02	379.22									
19		2/10	A00132									
20		20,95	421.27									
21		20,99	442.26									
22		21.00	463.26	,								
23		2095	484.21									
24		20.90	505.11									
25		21.06	57617									
26		21.15	547.32									
27		21.12	548.4A									
28		21.05	E89.49									
29		2.00	610.49									
20		21.10	631.59									
37		21.10	1062.59									
37		21.12	1093.71									
52		21.08	704.79							<del></del>		
35		21.06	725.85			4						
35		21.10	746.95			10						
2/1		11.00	767.99									

### **APPENDIX C**

**Well Development Field Forms** 



Project Name: Excelsion	Project No.:
Well No .: NSH - 007	Date: 10-23-2014
Location: NSH-CP	Measuring Point: Top of BOC, 3.3' STOKEN
Total Depth of Well (ft bls): 620	effen Interval (ft bis): 461-620
Pump Type/Setting (ft bls):	Activity: ANUF DERESPONENT
How Q Measured 7/10 to Fu Sund	H&A Personnel: J. Cook, C Gadre

	Discharge	Pumping	Specific	Sand	рН	Sp. Cond.	Temp.		Comments
	(gpm)	Water Level	Capacity	Content (ppm)		(µmhos/cm)	٩F		
		(ft)	(gpm/ft)	(ppm)					
	23			16				Swa yhl	
1,20	~20			710				AST WE	₹.
11:30	~21 -20		į	15_				Sundo	with Bit
	-20	-	1	20			W. Carlot	Air	
	-20	-		112			W.	Nic	1/21
153	0	SHUT	OFF	AIR	Fon	RISING			BT
158	0	484.2	FILMIN				FIMI	2	
200		480		denne.			4		
12:00		478	2.7	12:10	35	438			Motorican
12:00:		476		12:11	25	436	2.4		
12:0	2	474		12:12	25	434			0330 424.406
12:02		472	3.1	12:13:	25	432			
12:03		470	5.5	12:14:	30	430	1.8		445 451-417
12:03		468	9.2	12:15	50	428	53/57		605 46-425
12:03	1.30	466,	7.0	217	00	420		462-420	
	7.50	464	6.0	12:18!	25		0		4 4 4
- A	1:10	462 0		12:19.	55	422	//		1020 420-415
	20	460	6.0	12:213	35	420	10 Z	+ -	- 132
2:04	:55	458		12:23	25	418/	1.8 (4	57-416)	40 PTMIN (420
	20	456		12:25	15	416 Y	* \	- Control of the Cont	
7:05:	45	454	4.8	12:27	:20	414 >	110	424-408	
Z:06.	10	452		12:29:	35	412			
	40	450 A	4.0	15:35	100	410	1.0		
12:06:			1 '	12:34	: 30	409			
12:06:	_	448		160		1740		+	
12:07	:45	446		6.0		100			
12:07	:45	1611	3.4	6.0		700			
12:07	15 :45 :25 :00	1611	3.4	6.01		700			





Page 2 of 5

Project Name: BKBSIOR	Project No.:
Well No.: NSH-COT	Date: 10 - 23 - 14
Location: NSH-CP	Measuring Point: TOP OF BOP, 3, 3 STICKUP
	Screen Interval (ft bis): 469 - 620
Pump Type/Setting (ft bls): An UF	Activity: Anus Dover Dover PMONT
How Q Measured: 500 BUCKET	H&A Personnel: S. COOK, C. GANDWON

Time	Discharge		Specific	Sand	L pH	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level (ft)	Capacity (gpm/ft)	Content (ppm)		(µmhos/cm)	°F	
1256		(11)	(gpii/it)	70				3WAB - 20% GRAVE
1305				12				ARRITT 2016 BANES
1316				8				ARUFT, O'LLINGE
1320	70			7			;	BUAB NOL CRINE
1340				0				APLIFF, ~13/, CIANG
1406	Gan.	PRED A	124F	T FO	0 1	215114	HEAN	BRUFF, ~5% CAME
1700	210	11000	Frain		-	13/MG	LATION	Folmin
14:11	25	484		1	14.21	30	444	
1411	55	482			14/22	:10	442	3.4 3.0
14:12	:30	480			14 2	2.45	440	3.4
14:13	:15	478	2.7		14:6	3:40	438	
4:14	:30	476			14:2	5.30	434	
4.15	15	477			14:2	0:35	432	1.8
41:15	35	470	8.0		14:2	7:40	430	1.8
14115	50	468			14:2	9:00	428	
4:10	:10	466	6.0		14:30	0:25	4260	1.4
7:16	:30 :50	464	6.0					
14:16	7:10	462	6.0		,		<del>                                     </del>	
14: V	7:35	438	0,0					NIII
14:18	3:00	456						
14.18	7:30	454	4.0					
14:1	1:00	452	1/ 63					
14 19	7:30	450	4.0					
14 2	n: 40	448						• .
17.0		-1-100						
Comment	s:							
	-	*						4000 00000
	(47)						1	140

Project Name: 6x645x6R	Project No.:
Well No.: NSH -007	Date: 10-23-14
Location: NSH-CP	Measuring Point: 70 & BOP, 3.3 STICKUP
Total Depth of Well (ft bls): 620	Screen Interval (ft bls): 469-620
Pump Type/Setting (ft bls): Anuly	Activity: AIRLIFT DEFORMENT
How Q Measured: 5 AND BUCKST	H&A Personnel: J. COOK C. GARDNEN

Time	Discharge	Rumping	Specific	Sand	рН	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level	Capacity	Sand Content	-	(µmhos/cm)	°F	Comments
		(ft)	(gpm/ft)	(ppm)				
1450				7	MINU	Zarz	POST	54145, ~201, GRAVER
1500	30			18	認定	SE SANI	Ais	ARUA WOLGONAR
1520	23			19	41	9111,50	100	ARLIA - ZOL CONST
1530	23			25	11	И		ARLIF 120% GRA F
1545				7	THE PARTY			Anya ~151 GAAVET
[600	160			1.5			1	SWAR , ~ 201. GRAST
1620	10			11	42		AIRUPT	Siches - 10/ GANES
1630				7				AMILIET, 5-101 GRAVE
1033	- 56	TO DE	= A1	2 1	on	RISIN	6 HG	
1640		484	STAN		op w	ATCH	1640	
	) 55C	482	Plmi!	J				Form
1:40		480	2.4		124	5 44	Co	
2.40		478			13.4	10 40	14	
3:30	)	476			14:3	5 44	12	and the second s
4:23	0	474	2.2		/5: 3	5 44	0 2	20
5:2	)	412	1100		16.0	10 43	8	
5:4	5	4-10	4.8		07:5	0 43	60	
6:10	2	468	4.8		19-1	0 4	34	
6:3	5	466	4,8		20 -	0 43	32	
	0	464			22:0	0 43	30 /	3
7:3	0	462	6/0					
90.00		4(00)	4.0					•
8:3	5	(-/()						
7:10	)	456						
7 7	2	954						
10.3	3	452	47 0					
11 . 10	_	450	3.0					
11:31	2	448	2.7			\ <u>\</u>		
Comment	3× 6	O Ani	PT /	5				
	AFT	A 2				0		
	31 10	- OX	- ना	CIF		> K/3	SING	HENAD TEST

Project Na	ame:	A5101	2		Project No	0.:				
Well No.:	NSH	-007			Date:	10-73-1	14		W 1	
Location:	NSH	CA			Measurin		S' DI	BOP .	33'	Tresp
Total Dep	th of Well (ft	bls): 670	>			terval (ft bls):		070		1101
		bls): ARU			Activity:	Anisa	一人不	rapp	OF T	
How Q Me			KET	7	H&A Pers	onnel: 13.	K. P.D.	L. Lace	100	
		0				1,31	10,000	th Jai	1	
Time	Discharge	-Pumping-	Specific	Sand+	рН	Sp. Cond.	Temp.		Comments	
	(gpm)	Water Level	Capacity	Sand + Content		(µmhos/cm)	%F	11.33		
		(ft)	(gpm/ft)	(ppm)						
1236	) —			10				บกษอ	~15%	GANGE
1740				9			-	A. river	NO%	Grave
1750	-20 M							1.1.[]	0/10	1 .
1400	20			6				AL I FI	N100	CANI
1610	10			$\frac{\partial}{\partial i}$				Martin 12	10%	/ ,
1620	15			7				Mac Co	~10%	Grand
1133	15	·		2.5	<del> </del>			AVC 51	303/	12 (an
1845				0.4				11	15/	6 (
1855	11	9 33 7		0.9	<del> </del>	-		1 1 1 9 p	0% (	- Cavil
1904	23		74	8.5		1		12.14.11	5/;	1.4
1915	4)							+1	16/.	1)
100	d).			9				1)	10%	11
1925				4,5				1/8	5%	à f
1935				5				4.6	5%	
1945	17	7								
	Urps	487								
1954	Tier	485								
1158	17	473	7.0							
1958	29.84	471								
1959	17	469	7,0				_			
1959	17	467	7,0			,	,			
2000	14	445	8.6							
2000	13	463	9.2							
2000		461	4.3							
2001	11	454	10.9			1				
	19	457	6.3							
	12	458	10		<del>                                     </del>	<del>                                     </del>		<b>†</b>		-
2003	12	453	10		<del>                                     </del>	+ +		<del>                                     </del>		,
	13	455	9.2	<del>                                     </del>	<u> </u>	<del>                                     </del>		1	<del></del>	
	1.0	771								
Comments	S: 17	0		300	/_				_	- 1
	201	RATE	7 6		TIM	5 /N	STE	70 1	34 5	Cuid
	1 1	,			202			1		0

Project Name: Excusion	Project No.:
Well No.: NSH-037	Date: 10/23/14
Location: NSH-CP	Measuring Point: Top of BOD 3.3 Sticking
Total Depth of Well (ft bls): じ 2 さ	Screen Interval (ft bis): 467 - 625
Pump Type/Setting (ft bls): Airi-1+	Activity: A: Mist Development
How Q Measured: 5 Galla Briked	H&A Personnel: 3. Kienen Serger

							•	<u> </u>		
Time	Discharge	Pumping	Specific	Sand	pН	Sp. Cond.	Temp.		Comme	nts
	(gpm)	Water Level	Capacity	Content		(µmhos/cm)	°F			
		(ft)	(gpm/ft)	(ppm)		PRED SEA				
2020				0.47				Shra	01/	Gravel
2030	30			7				AITH	75%	: 1
2040	53			5				1.	5·1.	g b
7050	18			4				3 %	5.1.	4.
7100	17			4.5				11	5.1.	1,
7113	18			3				131	45%	¥ *
			1							
						1				
					E.					
	Ť							1		
								1		
									,	
						-				
								-		
		-	<u> </u>							
	· .									
Commen	ts: 5J	spril	Dev	lap!	~~	Wel	10	71:	14	
				•						
		<del></del>							•	

	1		
Page		of	

Project Name: Excelsiv	Project No.: 38681
Well Site: NSH-007	Date: 2/11/15
Location:	Cased Depth (ft, bls): 469' (yen ht - 640)
Total Depth of Corehole (ft, bls): しい	Measuring Point:
How Q Measured: Visual Estmale	Staff: Tielson

Time	Discharge Rate (gpm)	Airline Depth (ft)	Sand Content (m/li)	рН	Condutivity (mS/cm)	Temp. (°F)	Comments
1330	300 spm	1010	<del>-</del>		_		Start air lifting
1400	120	2640	40-1	Abun	ent drilling +	Wiel / poly	ne; mal boars
1415	20	2640	40-1	10	((	10 (0	• (
1430	20	~640	wil	, K	١, (	·μ	11
1445	20	~640	40-1	- (1	١(	Τţ	1
1500	20	~ 640	40.1	((	ŧ (	V (	'(
1515	20	~640	eu-1				beenvie, abundant drill Alviel
1530	20	1640	C0-1	Na salish	lar appol	rung xin inh	inud mud
1545	20	1630	CO-1				miner dolling flight
1600	au ·	7630	20-1	٠, ر		Ci	the transfer
1605	Shut d	en for 1	5 min				
1615	70	630	3mL	It bown o	olpolymer;	fine - med Si	nel
1030		en Ar 15		-251	thof GI	coved in	to see botten
1650	20	630	2 ml	Il ba	n w/ minor	polymer to	rilling Glord (fine-mad Sence)
1700	End A	rlift + 9	ull up in	nb: casir	5(469)		
		<u> </u>					
-							
<u> </u>							
-							
Additiona	l Comments:						

_			
Page	_1_	of	- 1

Project Name: Excelsion	Project No. 254 54
Well No .: NSH-007	Project No.: 38681
Location:	Date: 2-16-15, 2-17-15
Total Depth of Well (ft bls): 620	Measuring Point: TOP OF PIC (1.88' Stickup)
Pump Type/Setting (ft bls): 405 594	Screen Interval (ft bls):
How Q Measured: EM NETER	Activity: DEUELOP
THE HE	H&A Personnel: KFORD

Time	Discharge	Pumping	Specific	Sand	pН	I Sn Cond	T To	
	(gpm)	Water Level	Capacity	Content	Pil	Sp. Cond. (µmhos/cm)	Temp.	Comments
		(ft)	(gpm/ft)	(ppm)		(Hannos/CIII)	30	
1200	STARCE	PUMPING		11-11-11				
1206	49.83			5-1-4	(a) =	- N		
1217	STOP P	IMPING - E	NLARGE	SUMP	17 10 21	rspersio-	1	Brown : poly mud thick
1234	STARK	PUMPING		30 11(1		<del> </del>		
1238	42.85			0.3	+	20'0	<del> </del>	
1245	42.13			0.3		RBID		Brown-polyland
1255	40.74			0.3		26,3		" ,slightly cleaver
1315	35,44					0.83		Slighth clear
1320	18-12			0.7	TU	CB: A		Slightly decree
1335	17,45			0.2				Light brown, cloudy, some a
1346	18.52			0.6				White, cloudy minar poly
1358	17.62		10					white cloudy slightly cloudy a
1410	17.56			0,2	ille.			white cloudy slightly cloudy a
1420	17.62			0.1	2			white, slightly cloudy trace poly
1435	7.62			0.1				white slightly cloudy.
1550	17,84			0.1				white slightly cloudy
1620	16.56			(0.1	5.7	430	14.2	clear
706	17.50			20,1	6.2	430	20.6	dear
1800	~17.30			- ' '	6.06	451	2019.9	Clear
2-17			,	0.1	6.49	460	20.42	dear
				4				
+	*		-					,
	3							
			•					
comments:							100	
- Innonts	7370	gal on	tate 0' -	0 - 0	. 1	r 1		1
		Jan or	المحدد المحدد	C 60	ed s	T day		
			-					
	8							

HALEY& ALDRICH	ĺ	CALC	ULATIONS			File I		<b>2</b> of S
Client	EXCELSIOR					Date		-17-15
Project						Com	puted By	
Subject	DEVELOP	STEP RATE	NSH-00	7		Che	cked By	
State	water: 32	18.24 bmp	(top of F	VC = 1.	88 FL 5	hickup)	HOUE TO	OF AMO
Time	Discharge !	Water level	1 100	Sal	T . 3	Sp Cad	Temp.	(one-ty
4	7		(Il/gp -)		1,			
0700	Start pu	moiner, mak	1	no mu	poly,	adjust	flow to	~8gp~
0705	8.51	(Souder pluggod)		0.1	5.91	413	17.03	dear
0715	8.28	406.81	7.1	40.1	6.88	476	2011	deal
0725	8.34	410.78	7.5	40-1	7.03	473	19.95	clear
0730	Adjusted A	on (meter	clogged)	40.1	7.77	464	19.08	dear
0735	8.56	417.68	8.1	<0.1	7/13	476	70.52	clear
0740	8-46	420.30	8.5	0	7.25	476	20.42	dear
0745	8-51	422.46	8.7	0	7.31	473	20.20	dear
0750	8.46	424-45	9.0	0	7,17	476	20.62	dear
0755	8.46	426.11	9.2	0	7.28	475	20.33	dear
0800	8.46	427,22	9.3	40.1	7.27	475	20.58	chear
0802	open value	Fully - ~	as Flow					
0807	43.64	490,90	3.3	0.1	7,14	472	19.88	dear
0810	42.08	509.35	3.8	0-1	7.12	473	19.98	dear
0815	41.85	511.90	3.9	0.1	7,12	470	70.08	dear
0820	41.35	519.81	4.1	0.1	7.11	474	20.12	dear
0825	40.79	528,40	4.4	10.1	7.14	476	20,42	chear
0830	40.79	529.35	4.4	440.1	7.12	474	20.10	clear
0842	38.34	565,90	5.6	40.1	7.13	478	20.60	clear
0850	20.24	577.35	11.3	40.1	7.21	471	20.71	dear
0855	20,42	576.80	11.2	40.1	7.18	476	21.11	dear
0900	20.24	576.80	11.3	10.1	7.15	475	21.18	deal
0908	19-18	577.02	11.9		7,14	478	21.32	dear
0910	Stop puny	مالع ، جوده ب	~ 1/211	Hour	1	olg V		
0915		546.23						
0920		530.72						
0925		529.70			-			
0935		529.67			-			
	4	524.76	-	1				
0940						1		
2 0945	1 4 1	517.80	481	200		1		=======================================
0945	1	512.63			1	1	1	1
1005		511.30		1				——(
1005		500.57						

Page of 5

Project Name: EXCESSION	Project No.: 38681
Well No.: NSH-007	Date: Z-17-15
Location: NSA-CP	Measuring Point: 10P OF 1" PVC 2-30" als
Total Depth of Well (ft bls): 66	Screen Interval (ft bls): 358 - 498 , 538 - 618
Pump Type/Setting (ft bls): 465100 -30 € 592	Activity: PUMP DEVELOPMENT
How Q Measured: SPT PROPERTY 1/2"	H&A Personnel: 5. COLLINGS

(gpm) Water Level (capacity (ppm)) (ppm) (	Time	Discharge	Pumping	Specific	Sand	рН	Sp. Cond.	Temp.	Comments
1010 STANTES PAINNING & They on CLOSMES VALUE  1013 -2 495.6 1015 491.1 1020 STAC 485.14 1025 STAC 485.14 1025 STAC 485.14 1023 3.64 473.94 1033 3.76 466.65 1045 3.72 448.92 1050 4.09 423.33 1105 4.08 425.55 1110 4.08 425.55 1110 4.09 425.85 1110 4.09 425.85 1110 4.09 425.85 1110 4.09 425.85 1110 4.09 420.88 1125 4.14 416.86 1135 4.14 416.86 1135 4.14 416.86 1135 4.14 416.86 1135 4.14 410.9 1136 4.20 410.9 1159 4.20 410.9 1159 4.20 410.9 1159 4.20 410.9 1169 4.20 410.9		(gpm)	Water Level		200000000000000000000000000000000000000	*	(µmhos/cm)	۰F	300 71 han 0
1013 ~2 495.6 1015 ~ 497.1 1020 \$76 485.14 1025 \$76 485.14 1025 \$76 485.14 1025 \$76 485.14 1025 \$76 485.14 1025 \$76 485.14 1025 \$76 485.14 1025 \$76 485.14 1025 \$776 486.65 1026 \$776 486.65 1027 \$776 486.65 1028 \$776 486.65 1029 \$776 \$776 \$776 \$776 \$776 \$776 \$776 \$77						3			
1015   1/91	1010			MANG	21	Zog	on ow	5/WZ 1	ALVO
1020 3.76 485.14 1025 3.81 473.40 1035 3.64 473.44 1035 3.76 466.65 1030 3.64 473.44 1035 3.76 466.65 1030 3.64 473.44 1035 3.76 466.65 1030 4.09 442.38 1055 4.08 436.78 1100 4.08 432.47 1100 4.08 432.55 1110 4.20 82.58 1130 4.14 416.86 1135 4.14 416.86 1135 4.14 416.86 1135 4.14 419.44 1155 4.20 416.81 1150 4.20 410.81 1150 4.20 410.08 1120 4.20 408.63 1120 4.20 408.63 1120 4.20 408.63 1120 4.20 408.63 1120 4.20 408.63 1120 4.20 408.63 1120 4.20 408.63									
1025 3.81 473.40 1035 3.74 473.44 1035 3.76 466.65 1040 3.86 456.75 1045 3.72 448.72 1055 4.09 442.38 1055 4.08 436.78 1100 4.08 432.47 1110 4.08 425.51 1110 4.20 620.58 1125 4.14 416.86 1135 4.14 416.86 1135 4.14 412.41 1155 4.20 416.81 1155 4.20 410.88 1120 4.20 410.08 1120 4.20 410.08 1120 4.20 410.08 1120 4.20 410.08 1120 4.20 410.08 1120 4.20 408.63 1120 4.20 408.63 1120 4.20 408.63 1120 4.20 408.03 1120 4.20 408.03 1120 4.20 408.03 1120 4.20 408.03		16. 1				DIF	i		
1030 3.64 473.84 1035 3.76 446.65 1046 3.86 456.75 1046 3.72 448.72 1050 4.09 442.38 1050 4.08 432.47 1105 4.08 425.51 1110 4.20 422.85 1120 4.20 420.58 1130 4.14 416.86 1135 4.14 412.94 1150 4.20 410.81 1150 4.20 410.81 1150 4.20 410.81 1150 4.20 408.63 1120 4.20 408.63 1120 4.20 408.63 1120 4.20 408.02 1120 4.20 408.03 1120 4.20 408.02 1120 4.20 408.03 1120 4.20 408.03 1120 4.20 408.03 1120 4.20 408.03							AND	GPI 9	EVENTUE AT LUW PROTE
1035 3.76 466.65 1040 3.86 456.75 1045 3.72 448.72 1050 4.09 442.38 1055 4.08 432.47 1105 4.08 432.47 1107 4.08 425.51 1110 4.08 425.51 1110 4.08 425.85 1120 4.20 620.58 1130 4.14 416.86 1135 4.14 412.94 1155 4.20 410.81 1155 4.20 410.81 1150 4.20 410.08 120 4.20 410.08 120 4.20 408.63 1215 4.20 408.63 1220 4.20 408.63 1230 4.20 408.63 1240 408.63 125 4.20 408.63 125 4.20 408.63 125 4.20 408.63 125 4.20 408.63		3.80							25: 130,9Z=
1040 3.86 456.75  1045 3.92 448.92  1050 4.09 44238  1055 4.08 438.75  1100 4.08 432.47  1101 4.08 425.51  1119 4.20 6120.58  1120 4.20 6120.58  1130 4.14 416.86  1135 4.14 416.97  1140 4.20 614.99  1155 4.20 410.08  1150 4.20 410.08  1120 4.20 408.63  1120 4.20 408.63  1120 4.20 408.63  1121 4120 408.63  1122 4.20 408.63  1125 4.20 408.63  1126 4.20 408.63  1127 4.20 408.63  1128 4.20 408.63  1129 4.20 408.63		364							
1045 3.92 448.92 105 10066 1050 10.09 142.38 1055 1.00 1055 1.00 1055 10.00 10.	4.7.7		4/10.65					ļ	
1050 4.09 44238 1055 4.08 436.98 1100 4.08 437.47 1105 4.08 425.51 1110 4.08 425.51 1110 4.08 425.51 1110 4.09 425.51 1110 4.00 420.58 1125 4.14 416.86 1135 4.14 416.86 1135 4.14 412.44 1150 4.80 411.84 1150 4.80 411.84 1150 4.80 411.84 1150 4.20 410.81 1150 4.20 410.81 1120 4.20 410.81 1120 4.20 410.82 1120 4.20 410.83 1125 4.20 408.63 1125 4.20 408.63 1125 4.20 408.63 1125 4.20 408.02 1120 4.20 408.02	27 300					-	,		
1055 4.08 436.48  110 4.08 432.47  110 4.08 425.5]  1110 4.08 425.5]  1110 4.0 420.88  1125 4.4 42.88  1130 4.4 46.86  1133 4.4 46.86  1135 4.4 412.94  1150 4.20 412.94  1150 4.20 410.08  1150 4.20 410.08  1200 4.20 410.08  1200 4.20 408.63  1215 4.20 408.02  1220 4.20 408.02									C5= 100.60
(100 4.08 432.47 (105 4.08 428.75 (110 4.08 425.5) (115 4.14 422.85 (1125 4.14 416.86 (1135 4.14 416.86 (1135 4.14 412.37 (1146 4.26 414.03 (1146 4.26 414.03 (1155 4.20 416.81 (120 4.20 410.08 (120 4.20 408.63 (215 4.20 408.63 (220 4.20 408.02 (220 4.20 408.02								ļ	
1105 4.08 428.75 1110 4.08 425-5] 1115 4.14 422.85 1125 4.14 416.86 1135 4.14 416.86 1135 4.14 412.37 1140 4.20 414.03 1155 4.14 412.44 1155 4.20 410.81 1120 4.20 410.08 1120 4.20 408.63 1215 4.20 408.02 1220 4.20 408.02 1220 4.20 407.41	10 55								
1110 4.08 425.51 1130 4.14 422.88 1135 4.14 418.43 1135 4.14 418.37 1140 4.20 414.03 1145 4.14 412.94 1150 4.20 410.81 1150 4.20 410.81 1120 4.20 408.63 1215 4.20 408.02 1220 4.20 408.02 1220 4.20 408.02 1220 4.20 408.02 1220 4.20 408.02	1100		432.47					,	
1135 4.4 422.85 1130 4.20 420.58 1135 4.4 416.86 1135 4.4 416.86 1135 4.4 419.93 1150 4.20 419.94 1155 4.20 410.81 1200 4.20 410.08 1205 4.20 408.63 1215 4.20 408.63 1215 4.20 408.63 1220 4.20 408.63 1230 4.20 408.63			428.75					ļ	
1130 4.20 418.43 1130 4.14 416.86 1135 4.14 416.86 1135 4.14 412.37 1140 4.20 414.03 1150 4.20 411.84 1155 4.20 410.81 1200 4.20 410.08 1205 4.20 408.63 1215 4.20 408.02 1220 4.20 408.02 1220 4.20 408.02 1220 4.20 408.02								ļ	
1130 4.14 416.86 1135 4.14 416.86 1135 4.14 415.37 1140 4.26 414.03 1150 4.20 410.81 1200 4.20 410.08 1205 4.20 408.63 1215 4.20 408.63 1220 4.20 408.02 1220 4.20 407.41								ļ	
1130 4.14 416.86 1135 414 416.87 1140 426 414.03 1150 4.20 412.94 1155 4.20 410.81 1200 4.20 410.08 1205 4.20 408.63 1215 4.20 408.02 1220 4.20 408.02 1220 4.20 408.02		4.20							
11:35 414 415.37  11:40 4.20 414.03  11:45 4.14 412.94  11:50 4.20 410.81  1200 4.20 410.08  1205 4.20 408.63  1215 4.20 408.02  1220 4.20 408.02  1220 4.20 407.41			418,43			10011		ļ	
11:49 4.26 414.03 11:45 4.14 413.94 11:50 4.20 410.81 1120 4.20 410.08 1205 4.20 409.29 1205 4.20 408.63 1215 4.20 408.02 1220 4.20 408.03	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1					1			
11:45 4.14 412.94 11:50 4.20 410.84 11:55 4.20 410.81 1200 4.20 410.08 1205 4.20 409.29 1215 4.20 408.63 1215 4.20 408.02 1220 4.20 407.41	1135								
1150 4.20 410.84 125 4.20 410.08 1205 4.20 409.29 1205 4.20 408.63 1215 4.20 408.03 1220 4.20 408.03									
135 4.20 410.81 1200 4.20 410.08 1205 4.20 409.29 1210 4.20 408.63 1215 4.20 408.02 1220 4.20 408.02									DS5 64,78T
1200 4.20 410.08 1205 4.20 409.29 1210 4.20 408.63 1215 4.20 408.02 1220 4.20 407.41		4.20						ton	
1205 4.20 409.29 1215 4.20 408.63 1220 4.20 408.02 1220 4.20 407.41	-								
1215 4.20 408.63 1215 4.20 408.02 1220 4.20 407.41	1200	4.20	410.08					1	
1220 4.20 408.02	1205								
1220 4.20 407.41				ļ			1		
									A5, 59,78 FT
Comments:	1220	4.20	107.41					1	
	Commen	its:			V				
			Mariana de la compania del compania del compania de la compania del compania de la compania de la compania del compania de la compania de la compania de la compania de la compania del compania del compania del compania del compania del la compania del	4					
					1	do-			
						No.	50-329-3		

Project Name: Excel 3100	Project No.: 3868
Well No.: NEH -007	Date: 2117115
Location: NSH-CP	Measuring Point: TOP OF 1" PVC - 2.30' als
Total Depth of Well (ft bls): 618	Screen Interval (ft bls): 358-499 538-618
	Activity: Pump Pevelopment
How Q Measured: GPT Propellar 12"	H&A Personnel: S. Colling &

Time	Discharge	Pumping	Specific	Sand	рН	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level	Capacity	Content		(µmhos/cm)	°F	STATIC E 348,24
		(ft)	(gpm/ft)	(ppm)				
1225	4.20	406.95						
1230	4.2/	406.49						
1231	1							Tucrosse Flow to 12 apr
1235	12,00	417.91						,
1240	11,90	429.06						
1245	11.74	437,55						15-89.31
1250	11.63	444,23						
1256	11.58	450,51						
1300	11.52	453.96						
1305	11.41	457.60						
1310	11.41	400 35						
1315	11-36	462.78	. ,					- 1000000000000000000000000000000000000
1320	11.36	464.85						
1325	11,30	466.60			nile .			A=118
1330	11.30	468.31			3870			
1334	11.30	469.591	27					
1340	11.24	470,45	1					
1345	11.24	2 471.00	197					
1353	11119	471.70						
1355	11,24	471.92	C. Alex					
1400	VI.15	472.80	Tree!					Shut down Pamp
1400		465,01		/				
1403		448.05	٠					
1405		436.41				b <sub>1</sub>		
1407	(	430.13				,		
1410	_	423.02						1000
1425		413.06						
1420		416,21						
Commen	ts:				4			
				II wa	201			
- 11					00/2004 7400			

Project Name: Excelsion	Project No.: 3868 (
Well No.: NSH-607	Date: 2/17/15
	Measuring Point: Top OF 1" AUC - 2.30" ak
Total Depth of Well (ft bis): 66	Screen Interval (ft bis): 358 - 498 538 - 618
Pump Type/Setting (ft bls): 405100 - 30 + 59-2	Activity: Prins Development
How Q Measured: GPT Propellar 1/2"	H&A Personnel: 5.Colling@

Time	Discharge	Pumping	Specific	Sand	рН	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level	Capacity	Content		(µmhos/cm)	٩F	
		(ft)	(gpm/ft)	(ppm)				
1425		398,417						
1430		349,44	Adja	1ast A	ow to	46gpm		Restarted o 1430 e 16 gam
1433		425.41				3		
1436		437.62						
1438	15.84	444.10						Mousted
1440	15.67	448,97		0	6.55	456	20.23	
1445	16.22	463.46		6		4-	20.00	3.8 rapt
1450	16.06	471.77		0 3	7.03	474	20,60	3.8 rurb
1455	15.94	475.65						4
1500	15.85	479.25		-	ŧ			
1505	15,84	482.88						Contractor in successive 2 con-
1510	年.72	485.69		<i>Z</i> *	19 . (1	4:33		0.10
1515	15.62	490.58		€	7.19	472	20.68	9.73 turb
1520	15.50	495,05				Jan	76 2	A 12
1535	15.40	499,39		0	7.19	473	20.75	0.63 turb
1530	15.40	501.76		4,	7.0	1 (m) 1 d	26.00	
1535	15.34	503.18		-&-	7.21	474	20.82	1,26 TULB
1540	15.28	505.55		a.	7 10	1170	24.22	
1545	1522	507.83		0	7.19	472	20.82	0.57 Turb
1550	15.16	508.92		1	7.20	475	0 (x c. ()	000-
1555	15.16	509.26		0	1.90	46	20,90	0.59 turb
1600	15.10	509.83		0	7.15	473	20.71	0.81 Turb
1605	15.16	510.09	•		7.10	7/15	20.11	U.S) TUPD
1610	1510	510.59		1	718	471	20.70	4.57 tarb
1630	15,10	510.88		000	44 6	1 1 1	40,10	Tigitatio
1640	15.00	510,00			7.22	470	20 / i	.83 turb
1650		311.61			1.00	77	20.61	.03 1.43
1600	11040	1 211 01		H TO		****		
Commen	ts:							
		Ret A	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			35	w	
	- 60° - W		VEC 200100 - 2					

Project Name: 5x55500	Project No.: 38/28
Well No.: WSL+-007	Date: Z/17/15
Location: SH - CP	Measuring Point: TOP OF 1" PUC e 7.3 als
	Screen Interval (ft bls): 358 498, 538-618
Pump Type/Setting (ft bls): 405/00 - 30 ← 592'	Activity: PUMB DE EXPINETY
	H&A Personnel: C GAN ST

Time	Discharge	Pumping	Specific	Sand	рН	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level	Capacity	Content		(µmhos/cm)	٩F	STATICE 348 24 by
		(ft)	(gpm/ft)	(ppm)				
1700	15.10	511.77		0.0	7100	478	20.9	1:12 NOV
1715	15.10	512,20 513,54		0,0	-			- CLBAN
1730	15-05	513,54		0,0	*			1 12500 51354
1730	+ 0	STANT	10	AMB	HONST	Mer	LTONIA	16
								,
	,							
15.								
· -								
-							ļ	
				ļ				
	4							
			FG.					
			*			,		
$\vdash$							1	
								- 1995
Comment	s:							
							1	
						<del></del>		

Project Name: 12/20215/2	Project No.: 38681
Well No.: NSH 008	Date: 10/26/14
Location: NSH-CQ	Measuring Point: TOP
Total Depth of Well (ft bls): 900 '	Screen Interval (ft bis): ARN B to 40 900'
Pump Type/Setting (ft bls): ARLIFT From TD	Activity: BO HOLE D VERY 5N
How Q Measured: VISUAL 65.	H&A Personnel: An NOR, A NOK

Time	Discharge	_Pumping	Specific	Sand	pН	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level	Capacity (gpm/ft)	Content (ppm)		(µmhos/cm)	°F	
010	STA			JETUS	on po	T P		AS STATE
320	130							ARSN
330	10-15			20	4/28	or GA		Anc
345	210			7	0/103	D1. CAN	NOT	April
350+	0							
405	Broso			9	0/25		MOGE	A 4F 5 50
1420	15-20			5	1/ Th	30% G	RAUF	AVELET
1430	210			5,4	1-2	0%. 4	no	LI LI
435	~10			4 w/	~20	GRA	JU	2
14:	Con	W N	ot, .	5014	4	3 Prus S	the state	ING UP
	A7	~400		300'	, P			THE ROLL OF
512	0 ~30	D						An 60
1525	10-15			20 ~	<del></del>		RAUGE	An or
153	10			20	/	11. an	AUT	APRINS
1550	40			71)	unt	01.6	5	ALLUU DO
15501	-0	A AFT						
-16					- 4			
	US W	A DIRECT				N SHA		
	Tanke and				711/3			
19	1 1 3				Parks.			Maria - Allin III
Comme	nts:	MP	OF	C -	mi	Arres	RA	FAX 1/1 SFAT
							Left -	
			AND AND SO					

Project Name: EXCESUR	Project No.: 39691-204
Well No.: NSH-005	Date: 10/30/14
Location: NSH - CQ	Measuring Point: (AND
Total Depth of Well (ft bis): 840	Screen Interval (ft bls): 720-840
	Activity: AIRILIT DOVOLOPMIENT,
	H&A Personnel: C. CANDAFM, P. AND EREN

Time	Discharge		100000000	Specific	Sand	рН	Sp. Cond.	Temp.	Comments
	(gpm)	Water	Secretary Control (1)	Capacity	Content (ppm)		(µmhos/cm)	۴	
MUUN	DIFFIC	(f		(gpm/ft)	3,0	+110	SBID		AIRLIPT SONGE
0445		DTM A			TR		JOY	STATIC	
0455			, 0		TR	CIE		2/15410	07-21 00 1 , 500.00
9500		17	OPT	= ALR			- 71 -	-	FOR INDUCTOR
	~10				0.2	CLOU	24		e 695 CAIRYNE
0556					0.2		VIZPI 17	-CLON	DY .
0600	V				0	CLAA	R		
0005	0								ADDING ZOTS HOLDE
						ļ			10 735'
0607	0								t-007 € 338,05 bm/
0020	0						DT	MEN.	5H-008 8 432' DIOL
1632 0631									AND RISING
			_	,					ARUPT SUNGO
0635		-			OH ~	190% RU	O'L PACK	<i>T</i> U	RBID
0650	V	-			<del>                                     </del>	0101			
7655	0	1		0.4	0	CLOU			K 44 - 1 - 1 -
0730				0.4	TRAC	701			FM. 41 NTU
075C		1			FICH	<u> </u>	COU	DY ME CO	GAL, TINTO
0755 3800	8						DIW.	D NK	1-007:344.85 bmp
1000							131.4	103	OOB add   Join + oo
				1		<u> </u>	-		buttoin @ 755'
0810	~15				0.1	TUVI	a id		10,10
2940	213			,	TR			LEAR	53.3 NW
0840	- 0						3	le .	
1855	215			,					ARUFT SURGE
0900	145				TR	160-	PHU		TURBID-CLOUDY
0910	45				TN		3 NTV		2 4
09/04	0						ine 1 7.1	Tromi	t 40 775.
Commer		0.01-	7/	41 -DA-	=	FET	CETAM	16.15	TRUY AND
	MA	BIDL	1	Tivit		Cit Z	1000		15/57
	(ANO	mine	2	2017	N.		- J J G	COKIC	
	SOND	CA	MIN	NI TIS	6150	200	WUTH	AN I	mHOFF CONF

Project Name: - x colsion	Project No.: 3 5651-204
Well No.: NSH - 008	Date: 10-30-14
Location: $NSH - CR$	Measuring Point: Land
	Screen Interval (ft bis): 720 - 840
	Activity: Airlist development
How Q Measured: Visual Estimate	H&A Personnel: C. GARDNON, C. PEICE

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Gapacity (gpm/ft)	Sand Content	рН	Sp. Cond. (μmhos/cm)	Temp. °F	Comments
2124	015	(it)	(abunut)	Q.	1170	NTU		T 1 2 1
0935				0.1	477	10 ( C		Turbid Bottom AIRC
0950	~15			TR	1000	25		Cloudy/clony
7951+					100	1910		CIOUCIY/ CIBOLY
	215			0.2 W	on 15	JER PA	ek?	Cloudy - TUNBIN
1025				TR '		4 NTU		CLOUDY
030	0							023001
1045	215					SARUE	S MOL	17
1050			0.2	to a	MM FI	TON PA		7UNS10-CLOUDY
1105				TR				CLOUDE
1120	~15							ARING 6 795'
1110	215			0.4		TUN	BIL	
1155	45			m	12:	BNTU		LOUDY
1155	<u> </u>							
1210	~15							
mo				TR				COUDT-TUNSID
1230				TR	100	NTU		Yarm
1730t	0							
1245	~15							ARLIND & 815'
1255	45			0.4	T	NB10	w/ 50	425NOU
1305	0			TR!	TU	130 - CL	COURT	425NT
1320	2/5							
0330	~15			TK	TV	NBID- C	COUCH	340 NM
1330+	0			- ORIGINAL STREET				
1345	~15							APRUNE TO 835'
355	~15			Z.0 w/-		TEN PACE		0
1410	45			m	AUN	BID-CU	UDY	
1410+	0		,				11	
Comment	s:							
		Sur = 35 30	***				300	
		100		2	X-200			

Project Name: OXCBLSIOR	Project No.: 38691-ZeY
Well No.: NSA-008	Date: 10-30-14
Location: NSH-CQ	Measuring Point: (AND
Total Depth of Well (ft bls):	Screen Interval (ft bls): 770-840
Pump Type/Setting (ft bls): Anuft	Activity: ARUR DEVOLOPMENT
How Q Measured: VISUAL 55TM ATE	H&A Personnel: C. GARDNER

Time	Discharge	Pumping	Specifie-	Sand	pН	Sp. Cond.	Temp.	Comments
	(gpm)	-Water Level	Capacity	Content		(µmhos/cm)	٩F	
		_ <del>(ft)</del>	(gpm/ft)	(ppm)			Ann	
1425	215			4.0			MIKUT	7 3012 65
430	MS			,		UNBID	~~	T SUR GB DI. AUTOR POCK 4 448 NTV
440				TR		UNBID-	COUD	9 99 3 270
440+	0 ~15							
1100	1			0.3 m	1 JA	Z MILLA	-72 13	30 TIMEM
K05				m	17/1	180-0	100	3.0 TUNBIN 558 HTU
15051	- 0			110	10	V 13/13 - C	20007	332 7. 3
515	25	- vad		0.6	01	DUDY -	TUAB	10
535	0							
595	~15	,				44.00		
1555	0				YW (	NSA.	007	361.34 bmp
1000	2/5							•
1600	15	fi .						
Hoze	1111							
1615	0							
1620	~15.				200	2 - A-0	212	DEVELOPMENT
1630	0	-			SNO	OL 3571	LICY	BENEWITTEN
				1				
				-				
			1					
								11-320
								STEEL TO
Comme	nts:							
ALCO C. 34-0								

Project Name: FXCF /SIR	Project No.: 38681-205
Well No.: NG 11-208	Date: /2/22/14
Location: N. of I-10, NR THETHING	Measuring Point: Top of MON, SWL= 336.33
Total Depth of Well (ft bls): 5 CRN: 720 - 840	Screen Interval (ft bis): 720-840
Pump Type/Setting (ft bls): NA	Activity: SWAB & Beat
How Q Measured: MA	H&A Personnel:

Time	Discharge	Pumping	Specific	Sand	рН	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level	Capacity	Content		(µmhos/cm)	°F	
		(ft)	(gpm/ft)	(ppm)				
1100	-							
1200	SWA	3						OF FN JAND, OFR. FN 9 RAVE
1300	Then	Switch	to Be	ril-				
1400	BAIL	Bay WONS	in one	hour.	NODUCE	S ABOUT	1 citer	OF FN SAND, OR, FN 9 ROVE
				,				
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						9		pt.
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Commen	nts:							
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Project Name: EXCESSIOR	Project No.: 3868
Well No.: WSA - 008	Date: 1-5-15
Location: PSH-CQ	Measuring Point: 70P OF 1' PVC, 3.73' STICK UP
Total Depth of Well (ft bls): 840	Screen Interval (ft bls): 770 - 840
Pump Type/Setting (ft bls): SUBMENTABLE / 709	Activity: PUMP AND SUNGE
How Q Measured: FM Flow MGTGR	H&A Personnel: C. GAND N &R

Time	Discharge	Pumping	Specific	, Sand	рН	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level	Gapacity	Content		(µmhos/cm)	92	
		(ft) bmp	(gpm/ft)	(ppm)			°C	
1150	0	337.1						STATIC WATER LOVER
1155	STA	M750 Pu	MANA	, Ard	10571	DO JAL	15	
1157	29							tu.nus 70
1159	5.36			0.0	7.5	270	20.8	WHITE W/ AIR JOUGH
1201	7.460	397.80					(1)	4 - 11 - 10
1205	7.07	398.60		0.0	7.9	260	21.9	WHITEW/ AIR > CKEAR
1210	7.24	402.85	9.1	0.0	7.6	410	71.8	WHITE - CLEAR
1216	7.18	408.90	10.0	0.0	7.5	410	22.2	CLOST WATER > CLOSA
1218		STING	NACUE	TO	n10	PPM	ļ	
1221	0		2 -					7-100
1224	0	355.9	*Zerou		Dro	PPING	-	356.9 PWL
1231	Ō	358.5	RESIDE	•				
1232	0	358,5						
1232	STAV		MPING	0,0	7.5	34.0	23.4	114== = 0.500
12117	10.44	432.1	8.3		BUKK	360 420		WHITE > CLEAR
1292	10.22	40.2	7		7.5		24.Z	WHITE > CLOUDY
1247		445.6	10.7	440.1	57	<i>390</i> <i>400</i>	73,9	WHITE - CLEAR
1252	10.11	ADI			1,7	سيوز ا	00,0	WHITE -> CUBAR
1253		धार्ख व	MP NO	VAZ	7.5	410	23,8	WHITE -> CLOUDY
1305		469,20	MISING	2 440.1	7,3	-110	0310	-061116 - 100001
13/0	-	486.91	40.2			<del> </del>		~14.72 gpm Got
1320	_	503.45	211.3					~14.44gpm FSTMATED
1370	0	202.13	1117					The raph Ballway 123
1330		19,116	·					
1343	14.77	503.2	11.3	0.0	7.6	340	72.0	1343 CLOUDY->CLOT
1350	14.44	512.30	12.1		1			AS = 175 FOOT
1350				2091	100			
		300 100	110	0	4.			-
Commen	ts:							
<u> </u>						TWO THE		
		- 4150	9)					
L	,							

Project Name: 5600510R	Project No.: 38681
Well No.: NSH-008	Date: 1-5-15
Location: NSH -CQ	Measuring Point: TOP OF 1" PVC 333 3.73 STICK
Total Depth of Well (ft bis): 840	Screen Interval (ft bls): 770 - 840
Pump Type/Setting (ft bls): SUBMOS BLE 709	Activity: PUMP + SUNGE
How Q Measured: EM From METOR	H&A Personnel: C. (ANDOS)

Time	Discharge	Pumping	Specific	Sand	рН	Sp. Cond.	Temp.	Comments	
	(gpm)	Water Level	Capacity	Content		(µmhos/cm)	2º		
		(ft)	1664A	(ppm)			°C	STATIC 337.1 bmo	
1400	594		MADIN	7-1				TURNS TO	
1405	19.97	523.2	9.3	0.0	7.6	410	23.8	WHITE -> CLOUDY	
14'0	19.24	543.6	10.7	<<0.1	7.4	410	24.1	WHITE -> CLEAR FINE	<u>_</u>
1415	18.79	556.0		40.1	7.4	390	24.8	CLOUDY > CLOAM PANT	155
1420	18.50	564.2	12.3	-	~	,	-	DS=227.1	
1420-	MOSO	57 10	125g	pm		- 16			
1421	0								
1430	- PUMF		28 ypm		5-41	I to a			
1435	24.90	578.7	-	40.0	7.4	400	24.6	CLOUDY -> CLBAR	
1440	23.50		11.3	2001	7.3	380		CLOUDY -> CLEAR	
1445				<<0.1	7.3	390	24.7	CLOUDS -> CLEAR	
1450	22.16	623.8		140.1	7.3	400	24.7	CLOUDY > CLOTAR	
1450		SUST TO	~ 30	gom	GASTE	5 100%	OPEN		
145L	0								
1500	Pum		35gpr					CLOUDY - CLARR	
1505	27.54	624.1		20.1	7,2	400	24.7		01.0951
1510	27.20	1000.1	11.9	0	7.3	400	24.4	about - cuark	
15/3	25.93	1071.9	13.2	0	7.2	390	24.7	CLOUDY - CLEAR	
1570	25.02		13.7	0	7.7	400	24.5	CLOAR 45=343.2	Fr
1530	-	689.5		6,000		_		05=352.4	
1650	0	(1/1/2-12)					N.		_
1559	+	449,0	0.050	<del>                                     </del>	1/2/2	141/	410		
1600	SVA		+ * * * * *		0202	1106 10	~10	900	
160	10.78	512. Z		KTE	7.6	400	24.1	COUNTY AND A COME	
1600			16.2	0	7.4			CLOUDY WAR & CLOAR	
1610	10.72	514.2	16.5	0	7.7	400	24.5	CLOUDY w/AIR-> CLOTE	
1615	10.72	5/8.5	16.8	0	7.4	410	7116	CLÓAR	i.
1620	10.12	13/0/2	10.3		1 1 1 7 1	110	127,0	I Cook IIC	
Commen	nts:								
		and the same							
			manuface: Allie						
	30,1	<u> </u>							
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Project Name: EXCEUSIOR	Project No.: 36681
Well No.: NSH - 008	Date: 1-5-15
Location: NSH - CQ	Measuring Point: TOP OF 1" PUC, 3.73' STICK UP
Total Depth of Well (ft bls): 840	Screen Interval (ft bls): 720-840
Pump Type/Setting (ft bls): 408m6n5186/709	Activity: PUMP + SUNGO
How Q Measured: FM Frow MOTER	H&A Personnel: C. GANDUSN

Time	Diocharas	Dumping	Conside	Sand	pН	Sp. Cond.	Temp.	Comments
rime	Discharge	Pumping Water Level	Specific	Content	рн	Sp. Cong. (μmhos/cm)		
	(gpm)	The second secon	Capacity (gphi/ft)			(µmnos/cm)	oc.	SHATIC 337.1 bmp
1/27=	10.72	(ft) 520.00	(Shunin)	(ppm)	7.4	410	24.9	CLOAR ASE 182.9
	10.66	521.20	17.3	0	7.2	470	25.1	CUTAR
1640	10.61	522.60			7:6-	900	-5.1	2001
		5 23 .70	17.5	-				
1650	10.56	524.60	17-0	0	7.4	420	25.1	CLOAR
1700			A				03,	CLOTIN
1701		585.H	13.Z	0	20 401 7.3	40410	24.8	CLOPK
1710	18.85	602.4			7:3	-10710	4.0	CCO W
1700	17.84		14.6		_	_		
1730		611.1	15.9	0	7.2	410	24.5	CLÓATE
1740	17.62	617,3		-	7.6	71.0	-	COM
1430		622.0	16:4	0	7.2	410	24.6	1,500
1000	17.28	0 V3 C	1612		7	-110	07:10	CIGAN
1800	70						-	
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Commen	ts:							
		The Resident						
	WHEN THE			III-wr	73375-22		- 0.55	- Materials

Project No.: 38681
Date: 11/6/14 - 11/7/14
Measuring Point: NONE
Screen Interval (ft bls): 835 - 1015 ?
Activity: D. HUCKES, C. GAMONEN G. FORTH FOUS HEE
H&A Personnel: D. Hincke

Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Content (ppm)	рН	Sp. Cond. (μmhos/cm)	Temp. °F	
10	(ft)	(gpm/ft)					
10	***						
			~30				
			21				trans. sand observed in we
10			~50				thenic at 810' -
10			0.3				tremie at 810'
TORM	5 (APLIN	E) PW	6600	W/ -	MANSIT	10N ST	TUO JUIGINT, and
TREM	15 AIRLIN	D' e	820	UFT	V6 05	TTUP	LEITIDIN SAND
			W9557	. Fro	m Gn		
Anri	NE 6 8	30, H	AKING				~ INC/L TRANS. SAN
TA	6650 N	1 AIRC	ina			OF F	in in woil)
~10	FOILM, 54	< and	1.0	TUIL	BID		AMUNT & 830
N10	FORM, MIA	105 Selins	1.0	7020	D		Aribree 840
110	. (	il	1.0	a RAY	_ ~ cer over	)	AIRline & 845
110	II.	11 .	1.0	gem			Arvine Q850
10	- U	1	1,0	apmi	\		A1212 0 8555 _
	ił	11.	1.0	1/ZAV)			Arvine C B60
10	li	, (1	1.0	MEAN			Aulie 0 870
10	લ	i t	1.0	rom			prilit e 880
	$t^{l}$	li.	1.0.15	barrige		·	Arlie & APP
10	€t	it	13	czange			Arlier @ 900
10	FORM		2	TAN			Arriveegio
10	LODM, FR SIA	ראים	1	TAN-0	me		Andline e 920
10	FN Sarto, Foi	myore	ì	orone			C 930
10	En House	V	1				@ 940
10	TV. FN SIM	~i	41	TOW			6 456
10			KI				asseo.
10_	someton	<	0 05	ton			C970
10			· 60.5	1504-			@980`
10			20.5	6.7	450	19.7	2nd Sample
	TNEM ARLI -10 10 10 10 10 10 10 10 10 10 10 10 10 1	TNEME ARLIN  AND  ARLINE & B.  TAGGOD NO.  -10 FORM, S.  NO FORM, MIN  NO II  10 II  1	TREME ARRING &  AND GARY  ARRUNE & BBD. M  TAKKOR NE/ AIRL  -10 FORM, SAND >  NO FORM, MINOR SOLIDS  NO 11 11  10 11 11  10 11 11  10 11 11  10 11 11  10 11 11  10 11 11  10 FORM  10	THEM E ATRLING & 820  AND GAPY WATER  ARCHNE & 830, MAKING  TAGOS Nel ATRLING  -10 FORM, MINN SOLIOS 1.0  10 11 11 110  10 11 11 110  10 11 11 10  10 11 11 10  10 11 11 10  10 11 11 10  10 11 11 10  10 11 11 10  10 11 11 10  10 11 11 10  10 11 11 10  10 11 11 10  10 11 11 10  10 FORM  10 FO	TREME ATPLING & BZO LIFTI  AND GARY WATER FRO  ARLINE & BBO, MAKING GAR  TAGGED Nell ATRLINE & BY  -10 FORM, SAND > 1.0 TURE  NO FLAM, MINOR SOLIOS 1.0 TURE  NO 11 11 1.0 GRAM  10 TOMM  10 11 1.0 GRAM  10 TOMM  10 TOMM  10 FRAMO, FORMIGNE I OFFINGE  10 FRAMO (CO.S.) TOMM  10	TREME ARLING @ 820 LIFTING OU AND GRAP WATER FROM GRAP WATER FROM GRAP WATER TAKED OF AND AIRLING @ 845'(TO)  -10 FORM, SAND > 10 TURBID  -10 11 11 10 GRAP - CHOPER NO 11 11 10 GRAP - CHOPER NO 11 11 10 GRAP - CHOPER NO 11 10 11 10 GRAP - CHOPER NO 11 10 11 10 GRAP - CHOPER NO 11 10 GRAP - GRAP	TREME ARRING & BZO LIFTING OUT THA  AND GRAP WATER FROM GRANT  ARRING & BBD, MAKING BRAY WATER AND  THOSE NOT AMPLING & BYS'(TOD OF F  -10 FORM, SAND > 10 TURBID  NO FORM, MINOR SOLIOS 1.0 TURBID  NO 11 11 110 GRAM  10 11 11 10 GRAM  10 FORM 1 10 GRAM  10 G

Project Name: Excels For	Project No.: 3668/
Well No.: NSH -OCA	Date: 11/7/14
Location: NSH - CS	Measuring Point:
Total Depth of Well (ft bls): 1018 ?	Screen Interval (ft bls): \$35'505'
Pump Type/Setting (ft bls): A ! tal - 1 trene	Activity: 1
	H&A Personnel: D Hackle

Time	Discharge	Pumping	Specific	Sand	рН	Sp. Cond.	Temp.	Comments	
	(gpm)	Water Level	Capacity	Content	11 70 1	(µmhos/cm)	°F		
		(ft) tan Isght tan	(gpm/ft)	(ppm)	ET E				
430	10	tap		10.5	78	420	72.5	@ 4000 995 a	60
2940	10	Isolut tan	clear	Trace	7.8	420	22.8	e 975 botton	
2950	10	· tv		tran	7.9	420	22.9	į v	
		4						<u> </u>	
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### DEVELOPMENT FIELD DATA LOG

SWL- 408.92 13TC

Project Name: FX UELS 1 OF 2	Project No.: 38681- 205
Well No.: X/5H -009	Date: /2/22//F
Location: MOF I-10, NR. Thi THING	Measuring Point: TOP OF MONUMENT, 3.0' ALS
Total Depth of Well (ft bis): 995	Screen Interval (ft bls): 9/3-995
Pump Type/Setting (ft bls): NA,	Activity: SWAB/Ball
How Q Measured: NA	H&A Personnel: 6 =

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pН	Sp. Cond. (μmhos/cm)	Temp. °F	Comments
147 5	SWARD							
1415	>							
	IP!							
1615-	-1700	BAIL	10 an	110r5 +	- 26	rtas of	505.	FN SAND.
V			, ,			V		
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	THE							
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	April 1							
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	,	L	<u> </u>	1	<u> </u>		1	
Commen	ts:							
								M 022 2

Project Name: Exc 525 i CR	Project No.: 39091	,
		[3 55'STICK UP]
Location: NSH - CS	Measuring Point: 700 07 CAS 1" PVC	SOUNDING TUBE
Total Depth of Well (ft bls): 395	Screen Interval (ft bls): 8/3-10/3-7	995 FT
Pump Type/Setting (ft bls): 533M5151BLE \$ 595 in	Activity: PUMP & SULUST	
	H&A Personnel: C. GAMDいらん	

Time	Discharge (gpm)	Water Level	Specific Capacity	Sand Content	рН	Sp. Cond. (μmhos/cm)	Temp.	Comments
Pura put		(ft) broc	(gpm/ft)	(ppm)			20	
1628	0	410.43					ļ	STATIC WATER LEVEL
16304		THES PUMS	INC (4	05100	1-30	4" 300	MENSIE	DE PUMP)
1632	40.0	1						
1632+	6.24		7					
1636	9.70	5937		0.0	4.2	290	22.0	21592
1642	8.40	593.9						
1645	8,42	578	0.05		12.			*
16450	0					4		
16501	0	440.00				,		
105/2		1N6						
1652	42	FUMPE	0 000	17 17	EN!	MIG I	Janon	3ú0
1055	1.65	~572						
1656	~30.0							
1657	0.95	-594			-7			
1703	13.7	593.80		0.0	7.7	570	22.8	LIGHT BROWN TO GRAY
17/0	12.8	593.74	0.07					CLOSOY TO TURBID
1711	0						<u> </u>	
1717+	PUMP	N6						100
1718	5.0	593.70	- 151		-7 /	and the state of	1000	CLOURT TO TURSIN
1725	11.9	593.80	0.06	0.0	7.6	520	77.9	CUOJOY TO TUNBIN
1730	0			7.24			ļ	
1742	Pumit	ING 23	7gpm			5126	(7.1 ()	0.1.01/
1750	11.4	593,92		0,0	7.0	420	24.8	CLOUDY
1820	, ,			8				CLOAN
1800	+0						-	
			6					
		-				- 1		
			L		<u> </u>	1	1	
Commen	is:							
								d %
<b></b>								
L				nerica:				

	Project No.: 38681
Well No.: 15th-009	Date: 1-4-2015
Location: NSH-CS	Measuring Point: 70P OF 1" AVC 358'STICKUP
Total Depth of Well (ft bls): 995	Screen Interval (ft bls): 813-995 FOET
Pump Type/Setting (ft bls): 637/508w5v5v3L5	Activity: PUMP + SURGE
How Q Measured: EM Flow METOR	H&A Personnel: C. GAZDNETZ

	Discharge	Pumping	Specific	Sand	рН	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level	Capacity	Content		(µmhos/cm)	8F	
		(ft) bTOC	(gpm/ft)	(ppm)			·C	
0800	0	415.00	517	77C	WATE	FR LO	から	BTOC 1" PVC
0803		100 PUM				3		
0804	43.5		- 0	40	7.0	420	20.0	TUNBID-CLOUDT O. Dryl
03060	30	Legalite	-	المارا	1	160t wa		,
0310	12.60	636.20		0.0	6.9	430	21.5	CLOSSY
0315	12.1	636:20	-> BOT	TOM.	SOUND	NE 400	9E	2000
0815+	0							
0320	0	463.7			5			1
0825	0	453.1						
08 <u>Z6</u>	STAM	@ PUM	DING					
9927	39.6	a.						TORBIO · CROJDY
0928	31.6				·			CLOJO?
0829	8.4							GUNG, CLUSING VAL
0830	10.3		ly.	•				
0332	9.9	636.20						ADDUSTED VALVE
0833	6.60	623.6	e15146	-010	7.0	480	22.4	CIOUDY
0837	6.7	617.3	RISINO				22	
0840	6.9	604.6	RISING	2	7.2	450	23.3	CIGAR
0844	7.1	597.0	RISING	25	3182'	0.0490		0845
1853	7.2	590.5	0.04		7,2	490	24.4	CUGAR
0900	7.24	588.45	24.0=	-/4PM				CUSAR
1905	7.24	588.25		J	7.2	480	25.1	CIGAR
0915	7.24	588.75		DIA	LOOW	$\mathcal{N}$		
A20	7.24	589.40	196		7.3	500		CIGAR
0926	7.24	590.45					25.0	
AZH	0	STOPPE	PUM	PINE	40	Lower	PUN	18 X5 XZ1' JTS)
7	28	- 4-	14	30.20		70 ~3	7472 F	50T -742 FEST
	- 2	-312	4			. 4	1-1-10	FIGHT
Commen	ts:	V20-21						
			W- 1 HWH-			100		

	Project No.: 3868
Well No.: NSH-009	Date: 1-4-442015
Location: NSH - CS	Measuring Point: TOP OF 1" PUC (3.50 STICKUP)
Total Depth of Well (ft bls): 995 747	Screen Interval (ft bls): 813-995
Pump Type/Setting (ft bis): 50 BMSKS 1815, 758	Activity: PUMP + SUNGE
How Q Measured: Em From METON	H&A Personnel: C. GANDNEL

Time	Discharge	The state of the s	Specific	Sand	pН	Sp. Cond.	Temp.	Comments		
	(gpm)	Water Level	Capacity F74 M	Content		(μmhos/cm)	2F			
		(ft) 670C	-				90			
1036		437.10	RISIN		5WL	@ 415	10 DTC	C e 0800)		
1040	STAN	TOD Pr	Whins	•				<u>,                                      </u>		
1041	33	GU NO	SJUSTA	NB	TO	7-7 y1	M			
1042	7.12				44					
1043	7.18	547.7		0.0	7.6	490	22.7	Croudy		
1046	7.12	552.3					9 .			
1050	7.02	558.7	20.5	10.0	7.4	490	23.5	CLOUDY		
1058	6.90	566.6	7							
1102	6,90	569.58	_	0.0	7.2	470	24.3	CLEAR - CLOUDY		
1105	6.90	572.05	22.8	it/go	M.			,		
1110	0.85	574.45	23.3	70.	7.2	490	25.0	CUSAR		
1115	10.85	576.40	23.6							
1120	6.85	578.00	73.8	0,0	7.3	480	25,3	CLEAR		
1125	6.80	579.75	24.2			700	7.1	1 1		
1130	6.80	581.10	24.4					- 1-		
1135	6.76	581.90	24.7	0.0	7.20	480	25.3	CLERE		
1140	6.74	583.15	24.9				-			
1140-				D you						
1141	10.33			9-						
1144	10.00	60.6	20.2 =	Class	7.2	480	25.6	CLEAR, 0.0 SAMS		
P - V	9.62	628.1	22.2	0.0	7.2	480	25.8	CIGAR		
1200	9.17	646.5	26.3		7.2	480	25.8	CLEAR , DID SAMO		
1210	9.00	653.5	26.5	7	7.0	,,,,	23,0	0001112 ) 515 01510		
1215		456.2	26.8	0.0	7.2	480	25.7	CLÓAN 05= 241.2'		
	8.84	659.00			7.2	480	25.7	CLBAR. Z6.0°C		
		461.05	27.6	0,0	7.6	700	, ,	, 20.0 C		
	8.78	462.50		0.0	7.3	480	25.7			
1240		NOASING +		<del></del>	۲،۲	700	25.1			
1690	K 100	MANAGE 4	0 21	Bapm						
Commen	ts:		Br	Dioiso	-/	/	_ /			
55	T WAX	15 78	M , 5	1895	From.	10,pm	130	pr.		
				e	15.	12.	. 1/ 3			
		ACTUR	IL RATE	~6.4	~8.	3	157			
			0F 60			ADJUST	rinis l	AUJ		

Project Name: EXCELSION	Project No.: 38681
Well No.: NSH-009	Date: 1-4-15
Location: WSH -CS	Measuring Point: TOP OF 1" PVC / 3.58' 5TICK UP
Total Depth of Well (ft bls): 995	Screen Interval (ft bls): 813-995
Pump Type/Setting (ft bls): SUBMENS & 742	Activity: PUMP + SUNGO
How Q Measured: 5M Frow MOTER	H&A Personnel: C. GANONÓN

Time	Discharge	Pumping	Specific	Sand	рН	Sp. Cond.	Temp.	Comments
Tillie	(gpm)	Water Level	Specific	Content	Pil	(μmhos/cm)	∘F	Comments
	(gpiii)	(ft) IOTOC	DIAME	(ppm)		(partition of only		
1243	12.82		20.7	W 1 /				STATIC 415.0 BTOC
1250	11.52	710,60	25.7	0.0	7.2	470	25.8 25.9	CLÉAR
13an	10.88	726.2	28.6	0.0	7.2	480	25.9	CLEAR
	10.66	730,95	29.6					BM 7085 6 ~ 737.6 bt
1320	10.44	733.10	30.5					DSS 318 FOOT
1330	10.44	734.55	30.6	0.0	7.2	480		CLÉARZ
1342	10.44	735,90	30.7					45= 320.9
1342+		5 PUMPIL						
		WEING 1	AUG	100%	OPE	7		
	+ 28.7	-	_	0.0	///	MALT	insto-C	WIDY IAM MODIATELY CLOSE
1358	PUM	Es MY	SHUT	OFF				
		, S						
1400		UCTES !	NWB	AND	3006			Tury
	BY	DIMPINO	win					O'l. OPEN
	The		How	RELO	19/0	FOIL	~10	MIN
	TH	in Kers	PATOD				ļ	
1 = - 0		0 4						
1500					1300b	Moist	COMP	678
	PUL	LINZ A	MP B	Q				
								Annual Control of the
								1000-11
4						ļ		
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Com	ła.			1.01				
Comment	147	+(3221)	-805'	ABONT	5,0A	5		
	7,10	. (3. 0)		1, 20-0	الله ال			-
		111011101000				2001		
			,					
	1 11 1111111							

Project Name: Excelsion	Project No.: 3869
Well No.: USH-010	Date: 3/7/15
Location: NSH-CT	Measuring Point: Top of 1" PVC @ 1.4ft abs
Total Depth of Well (ft bls): 4051 00 - 30 C 675	Screen Interval (ft bis): 378-598 + 638-698
Pump Type/Setting (ft bls):	Activity: Pump Development
How Q Measured: GPt 2" Propuller and	H&A Personnel: T, Nelson

	ર્વ	ucket tes	+ +	05		onnei: -/-, K		
Time	Discharge	Pumping	Specific	Sand	рН	Sp. Cond.	Temp.	Commands
	(gpm)	Water Level	Capacity	Content		(µmhos/cm)	°F	Comments
		(ft)	(gpm/ft)	, (ppm)		(parinto avoin)		
0615	7 1)0		onal	ansit	p (70	N54-c	1 42	2000
0630	Pull in	ansauce	- + 90			100H-C	1/0	
0640	dfw	574.60	7 4 00	2200	28			The state of the s
0(,50	start	O 4.V	2	1 -				
0730		Pulling	3 - 2	ints		A		
0735	OIAK	T PUMP	INC	Q.	-W 4	18.35	N4.	se abu
7740	425d	pm	2-10					
	~ 600	an ,	0.252	<u> </u>	10120	401	20.61	terbidity 613 NTV
0745	diny		sound.	2				
0815	bela.	o lawasc	- Y	·39p	m			
6830	1-600		0.27		6.13	396	20.30	terbidity 5.17 nTU
0840	STOR	Romoin	I RIL	an	7			To Cherry Sill Mic
		(	)'		P			
	п п							
								P33.
						1,		
en a.								
2								
omments								
				<u> </u>				
	<del></del>							

Project Name: Excelsion	Project No.: 38 68 \
Well No.: NSH-010	Date: 3/6/15
	Measuring Point: Topof 1" PVC @ 1.4 ft aba
Total Depth of Well (ft bls):	Screen Interval (ft bls): 378-598-638-698
Pump Type/Setting (ft bls): 405\00-30 C 675'	Activity: Pano development
How Q Measured: ( PZ 2" Vropelles an 1	H&A Personnel: T. News

Time	Discharge	Pumping	Specifio	Sand	рН	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level	Capadity			(µmhos/cm)	٩F	
		(ft)	(gpm/ft)	(ppm)				
5ا عا	T. Nel	in all	Evoits	Lons	ite @	D-HCU .	10	457.2094 @ endof d
640	000	n dtw 5	67.91	beas	n ou	moina.	start	ng @ v5gpm
	A CONTRACTOR OF THE PARTY OF TH	where	little	'clob		' ''		3 - 31
150	Ryld	y CRAY,	Justid	TAH	of to	54 0	-2 me/L	-
1	dtu	60025	v4.5	gan			, , ,	
1655	~ 2,L	25pm d	tw c.	23.98				
FUL	1,4	Sapir d	tu (o	36.11	MI	HOP 0	13 ml	/L SEA HUND - > ON A
705	V 1,2	342m d	In a	1321 10				401.400.000
1710		bysm d	1	54,40			e e	
730	N.O.		tw b	114	1008		Sta	
ercore-	buck	st test	- 5	9/1.13	hin y	4.850		lear water
1460	buck-	ex fest	59/	1.53 h	in v	3.27	m	
810	bucker	test 50	1.05			.,,		· - 5
830		et test	54/10	0417	nin,	r . :		
) & 50	bu cke	+ test	50110	6.935	4	56/m	-A	-428gpm
910	IMI	05 0	me/	Sand	1	5 5g	1410	stop timbing arecorer
06/5	two	1.4x 53	.3 nTU	1540	5 Pa	noin	fa->	v40 min
<u>066</u>	beain	pimpin	a 2921	h dti	J 63	0.50	- 01	the turbidity reader its
	SKIN	COLOC	256	olora	1 / 2	MHOF	5 m0/	I I I I I I I I I I
305	IMHOT ON	Donneter 5:	a, Z56	1 .	(00 60 Z	385	17,77	typoidity: 11.8 nTu
005		11246	JUST	ary!	OTAR		men	, it w past sanding
51)	the	613.45	18.250	TAMB	0.79	384	1994	L. ( ) \ 205.7
050	IMI+0	FORM P.	0.256	T	7.28		20.81	turbidity 29,5 nTu
15	28w	605.2		-	1 1 4 2 3	5-14	70,01	+ unbidity 16.7 NTU
50	dtw	593,98		- sun	:	a ~20		
200	dtw	410,43	1star	Form.	6,42	m ~ 20	pm	3.77
200	_	:01ml/L P'	0.258		6.40	398	1027	turbidity 3977TU
	1 -1-17 H	I & OHMYC PU	-600		1 6340	0 (0	LYCKAL	TO PICKY STATIO
ommen	ts:							and the second
						1-27-0		
		* *				0.0010030		
								In the same of the

Project Name: Excel Sicx	Project No.:
Well No.: NSH-010	Date: 3/6/15
Location: NSH - CT	Measuring Point:
Total Depth of Well (ft bls):	Screen Interval (ft bls):
Pump Type/Setting (ft bls):	Activity:
How Q Measured:	H&A Personnel: T. NeUSO

されなられるのからない Specific Discharge Pumping Sp. Cond. Temp. Comments Time Sand рН Capacity Water Level Content (gpm) (µmhos/cm) (gpm/ft) (ppm) (ft) 1215 gpm V7.5 626.45 393 0.256 1230 409 0.205 6.24 (,53,11 dea 654 409 0.266 22.21 0.26 cle 409 8.29,10 0.260 transducer 5N 391702 ~650 ft "NSH-010 3-6-15" 10 min invervals 611.85 Comments:

Project Name: EXLECTION	Project No.: 3868
Well No.: NSH-010	Date: 3/5/15
Location: NSH - CT	Measuring Point: TOP OF 1" PUC & 147 als
Total Depth of Well (ft bls):	Screen Interval (ft bls): 378-598, 638-698
Pump Type/Setting (ft bls): 405 (W 30 c (075)	Activity: PUMP DEVEROPMENT
How Q Measured: GPI Z' Propertion	H&A Personnel: C. GARDNON, T. NOCSON

How Q Measured: GPI Z" PROPERIEN					H&A Perso	onnel: C. (	SARDNE	5n, T. NEUSON	
		W BUKE		57		1012390x =1,0140x			-
Time	Discharge		Specific	Sand	рН	Sp. Cond.	Temp.	Comments	
	(gpm)	Water Level		Content		(µmhos/cm)	°F		
		-(ft) b'mf	(gpm/ft)	(ppm)		Figure VI El			
1130	0	549.0				STATIC			
1145	STP		MAUN			MOTO		MOUKING	
		DISCH	TOUT	15		<u> 1</u> NG	FUI	1, BONTONITE	
1200	15	(013.3			Dem		UID	HEAUY	
1210	0	Ce10,0			STOF		MAMUL		
1220	ADC	ING W		Fru		TWCK	, nl	(O gom	
1300	WATER	ADDED	TO TOP	OF	ASIN	G 11	110 a		
1305	378	rted ?	DUMPE	ha, t	ears	mud	502	15 apm	
94	im	16F CON	be, ju	-1584.	·loud	1,5 an		nlyL	
1315	V 46	cam a	louby.	vater.	- 4	1460	) F -	/	
1325	wat	ev) ~32	asm	560	1,50 c	tw			30
1336	dti	2 610 ft	Shir	2 970	m				
1345	PU	no rest	ofu	2th	1000	3a ahr	le pu	noing	1103
1400	dt	5 677 F	, vz				l I	( 0	0.00
140	~\ (=	n shuit	off oi	0,	Γ				200-22
1435	Ka A	DING W	ATER	FR	Din -	TRUCK	7	Ogpm	
1445	Star	t pynn	ine to	add in		27eV	W15	softet 600	
	much	, , ,	431	apm	)			3	
1450	dto	5394	+, wa	apm					
1505	elé	tou vor	er v	2500	m	die	632		
1515	dtw		,015ta	havae	15	Drubur	ater	~23 gpm	144 /
1534	17 m	T	455,80	mus	~	-9 9P	$\sim$	01	
	Add	water		n tra		96			
1540	dtw	somd							
16 € Ó		675.12		1	rery	test			The second
1645	dtw							5	1.
1670	1 1							1-6	
11075	9+00	(453.81		100					103
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Commen	ts:								
			10000					W.	
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								West and the second sec	-

Project Name: Excelsion	Project No.: 3868\
Well No.: NSH-010	Date: 3 5 15
Location: NSH-CT	Measuring Point: Top of 1" PYC@ 1.4Ft 2bs
Total Depth of Well (ft bls):	Screen Interval (ft bls): 378-598, 638-(98
Pump Type/Setting (ft bls): 4\651.06-30 C 6751	Activity: Pump development
	H&A Personnel: C. Gardner, T. Nelson

Time Discharge Pumping Specific Sand рΗ Sp. Cond. Temp. Comments Water Level Capacity °F (gpm) Content (µmhos/cm) (ft) (gpm/ft) (ppm) 647.50 628.87 611.81 ~25gm 1920 Comments:

	1		A .
Page	- 1	of	1.7
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Project Name: EXCELSICQ	Project No.:
Well No.: NSH-CIO	Date: // /3/14
Location:	Measuring Point:
Total Depth of Well (ft bls): 72c	Screen Interval (ft bls):
Pump Type/Setting (ft bls):	Activity: AIRLIFT DEVELOPMENT
How Q Measured:	H&A Personnel: D. ANDERSEN

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	рН	Sp. Cond. (μmhos/cm)	Temp. °F	Comments
1234			(01 /	60	-			Course sound = 20.
246		T A	A Commission of the Commission	The state of the same	* ******	Alba anna an anna	was the state of t	suttom + sunge
258		where the descriptions	artist and the second second	the designation is not to the second		party after hardered may be the	and the same of the same of the same of	START DEM AIRLIPING
1300				30				COURT ) HOW = 10
1305	7-	-		30		3		COURS SURVES
2310				100				(or-se sand = 10
315				100		7		Conse sind = 15 Conse sind = 10 Conse sand = 12
1320				80			· · · · ·	CONTRE SAND = 10
1325				80				const sand = 12
1325			A secretarization of spinor better a financial					Survey for 10 mm
340	,	AND THE PROPERTY OF THE PROPER		Printed the Landschafe Street, and it		21.100.00 hp. 0 1 5 4 4 7 4 1	-	Begin aitiff
34.2	i i			25	300			Surveyer for 10 mm, Begin aid It  (Devil Sand = 4:  Cavil Sand > 8
349	W. IT			80				carri sand . 8
353				7.00	Maria I	74.1		COOR Sund - 4 COOR SUND = 10 COORE SUND = CA
358	E 10			120	BL S			Cearl Sund=10
405				120		- 1-	= 111	(Dase sand = Co
							3.99	
1515								at BH ( 505 015
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	7							
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omment	s:		,					Section
				20,				
	_							

Project Name: Face(51072	Project No.: 3868/ - 205
Well No.: NSH-012	Date: / Z/72/14
Location: N. of I-10, NR The THING	Measuring Point: TOD OF MONUMENT
Total Depth of Well (ft bls): 501.7	Screen Interval (ft bls): 450 - 490
Pump Type/Setting (ft bls): NA	Activity: BALING
How Q Measured:	H&A Personnel: GT

Time	Discharge	Pumping	Specific	Sand	рН	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level	Capacity	Content		(μmhos/cm)	٩F	
		(ft)	(gpm/ft)	(ppm)				
1710		(ft) 4 Time to set	1 \$ 90	4 ~	2941	SOF	SOUD.	not enough
FRE	e mate	to set	Barler	valv.	l,		· ·	155
						***************************************		000000000000000000000000000000000000000
					1.7			
,								
								8000m
								3000
			*					
	,							
			114					
Comment	s:							
	- 20							
	·····							
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	Project No.:
Well No.: NS H - 013	Date: 11-7-14
Location: N5H - BW	Measuring Point: Land Sur Face
Total Depth of Well (ft bls): 1070	Screen Interval (ft bis): ODEN hovehole 650'-1070'
Pump Type/Setting (ft bls): air lift whit or hottom	
	H&A Personnel C. Price

	Time Discharge Pumping Specific Sand pH Sp. Cond. Temp. Comments							
Time	Discharge	Pumping	Specific	Sand	рН	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level USUPL TUNGS (ft)	Capacity	Content		(μmhos/cm)	°F	
		(ft)	(gpm/ft)	(ppm)				
6:00	~50	CLOUDY	308	1.9 mb/2	7.0	350	<u> </u>	airlift begins-close
612	250	Clear	22.4	0.1	7.6	350		V
1622	~50	clear	22.9	181	7.7	340		
623	_							endairlift, begin re
642								endairlift, begin re
645	~50	cloudy	182	1.5	7.3	340		
1654	~50	Clear	16.2	<0.1	7.5	360		
702	~50	Clear	30.4	0.1	7,5	360		end airlist.
			3071					
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Commen Dri San	ts: llers e	stimate vrement	on dis	charge vith	Imho3	F3 COU	Le.	
		-520						

Project Name: Excelsion	Project No.: 38691
Well No.: NSH-013	Date: 1-12-15
Location: NSH - BW	Measuring Point: Top of 1' PVC & 4.46' als
Total Depth of Well (ft bls): \ つつつ	Screen Interval (ft bis): Open 646 - 1070
Pump Type/Setting (ft bls): submersible @ 746.2	Activity: Pump development
	H&A Personnel: C Price

Time	Dischause	Dumina	0#	0	-11	I Co Cond	T	Commonts
Time	Discharge	Pumping Water Level	Specific	Sand Content	pН	Sp. Cond.	Temp. ∘F	Comments
	(gpm)	historia de la companya della companya della companya de la companya de la companya della compan	Capacity			(µmnos/cm)		
1,1/10		(ft)	(gpm/ft)	(ppm)				
1440	0	659.11				6		Static water lul
1454	P	mpon		umpi	Na	6 ~	20gp	M .
1457	20.54	683.40	0.86	((0.1	7,72	420	20.1	Cloudy who is I clear
<u> </u>		_		4 4 - 1		72.0 -	20.0	has small black Finkes.
1503	19.51	689.65	0.64	<<0.1	7.2	390	22.5	Clear
1510	18.20	697.75	0.47	<(0,1	7.3	390	<u> </u>	Llear
1515	18.06	702.59	0.42	40.1	7.4	390	22.6	loudy with air > clear
1521	17.64	707.44	0.37	240:1	7.4	380	23.1	Clear
1526	17.45	710.11	0.34	401	7.4	380	23.1	cloudy with air -> clear
1530	16.66	712.61	0.31	40,1	7.4	390	73.1	cloudy with cir of clear
1535	16.84	715.34	0.30	<<0.1	7.5	390	23.5	clear
1542	16.84	718,72	0.28	240.1	7.4	386	24,2	clear
1546	16.67	720-43	0.27	460,1	7.4	360	2U.8	cloudy withing " clear
1550	16.56	722.55	0.26	D	7.4	380	23.7	cloudy with air -> clear
1556	16:34	724.45	0.25	.0	7.4	340	24.4	cloudy with air > clear
1558	, , , , , , , , , , , , , , , , , , ,	adio	sting	Value	596		60%	149 A. C. Pharles
1600	19.24	727,25	0,28	0	7.4	380	23.9	cloudy with air > clear
iper 4	18.85	731.22	0,26	0	7.4	390	23.3	cloudy with air -> clear
1610	18,50	733.63	0.25	0	7,5	380	23.0	cloudy with air > 11ear
1616	18.40	736.25	0.24	0	7.4	350	23-5	cloudy with air -> clear
1623	8.06	738.65	0.23	0	7.3	380	23.6	cloudy with air->dear
1627	17.96	740.29	0,23	0	7.3	370	24.5	Cloudy with air -> clear
1634	17.45	742.45	0.20	0	7.3	380	24.0	Houby with air Feleur
1640	17.50	744.30	0.20	0	7.3	360	23.0	cloudy with oir >clear
1647	17.22	746.30	0-19	0	7.3	370	24.7	cloudy with air -76 year
1654	17.06	746.82	0.19	0	7.3	390	27,4	Cloudy with air -> 1/ear
1701	16.85	7 44.05	0.17	0	7,3	370	24.3	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
1704	ر ن سر	Pump						
11.5.1	1704 Pump OFF							
Comments:								
				-1111				nii Sira V
			711151158311WF34					

Project Name: Excelsion	Project No.: 38691
Well No.: NSI4 - 0 13	Date: 1-12-15
Location: NSH - BW	Measuring Point: Top of 1" PVC @ 4.46 als
Total Depth of Well (ft bls): 1000	Screen Interval (ft bls): Open 646 -1070
Pump Type/Setting (ft bls): Submersible @746.2	Activity: Pump development
How Q Measured: EM Mow	H&A Personnel: C'Price

Time 1	Discharge I	Dummina	Considia	Cond	ml.l	Cn Cond	Town	Comments	
Time	Discharge	Pumping	Specific	Sand	pН	Sp. Cond.	Temp. °F	Comments	
	(gpm)	Water Level	Capacity	Content		(µmhos/cm)			
130000		(ft)	(gpm/ft)	(ppm)	Cu Yara				
7度20	0	717.98	_	-		·	-		
Dao		Pump	on:	Val		<u> </u>			
1722	18.50	737.53	0.25	<60.1	7.3	380	22.5	cloudy wair > clear	
1727	17.84	737.92	0.23	<< 0.1	7.3	370	24.2	cloudy w/cir ->c lear	
1732	17.34	741.66	0.21	0	7.3	370	24,0	Cloudy wais -> clear	
1738	17.22	74460	0.20	0	7.4	390	23.6	cloudy whir -> clear	
1744	17.06	7 47.45	0,19	0	7.4	380	1823.7	cloudy wair -> elpar	
1750	16.56	749.05	0.16	0	7.3	370	25.0	cloudy whir -7 clear	
1752		Pump	2F5					* **	
		1							
								10-10-10-10-10-10-10-10-10-10-10-10-10-1	
								310000111	
								100,000,000	
								9-14-1	
							,		
1								1.36.30.	
	,					1			
Comments:									

Project Name: EXCEUSION	Project No.: 38601
Well No.: NSH-013	Date: 2/22/15
Location: NSH - 13W	Measuring Point: TOP OF 1" PK 0 3.1' all
Total Depth of Well (ft bls): 1070	Screen Interval (ft bls): 0Fov 050 - 1070
Pump Type/Setting (ft bls): 855,200 - 18 e 869	Activity: Pump Dovoropmont
	H&A Personnel: C. GADDNON, C. PRICE

Time	Discharge	Pumping	Specific	Sand	рН	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level	Capacity	Content		(µmhos/cm)	°F	
		(ft) bMP	(gpm/ft)	(ppm)			TO THE RESERVE THE PARTY OF THE	
1400	656.23	S FT BMP		511	377C	WATER	16	rá
1401	COM	MONCER	b Pu	MPINIC	لع	200	IPM.	
1405	20,23	707.33						cloudy wlair -> clear 6.6
1410	20.38	710.36	<b>—</b> /-	2000		-		cloudy w/cir -> Clear
1415	20.12	720.31	- J	120.1	-	<u> </u>	_	clear
1420	19.58	722.69	- E	0		_		cloudy wair >clock
1425	19,42	724.83	1	10.1	_	12		cloudy wlair y clear
1430	19.42	727.43	k 9	KCO.1	_		2	cloudy wair > Chear
1435	19,20	730.38	10.00	240.1	-	<u></u>	مسو	cloudy whir -> clear
1437	1	opened	value	to i	nerea	50 Flo	w to	20.55 gpm
1440	20.62	734.14	~	20.1	_			Cloudy w/air -> c/ear
1445	20.41	737.92		20.1	-		1,4	cloudy wair > clear
1445	Pun	tto an						
1450	0	0692.35	- " .		- 3	_	1	
1453	0	679.65	I =	- 1,5	1			20 To 10 To
1500	0	182.75			- 2			
1500		luned p	ONP	DN .	@	~ 30	gpm	Tage
1505	29.90	737,90	-	20.1	-	_		cloudy whair -> clour
1510	29.42	745.55	`	10.1	~		-	cloudy w/air > clear
1515	28.94	752.56	-	20.1	7-1			cloudy whair > clear
1520	29.20	758.68	4 - A	20.1	-	1- 1		cloudy wair > clear
1525	28.63	764.69	-	20.1		1	-	cloudy whit > clear
1530	29.26	770.30		10.	-	_	_	cloudy whair 7 clour
1535	28.63	774.68	1 - 18/1	20.1	_	-	_	cloudy whair > wear
	29.58	780.31	- 12	101	_	-	_	cloudy whair -> clear
1545	29.62	785.25	45	4	-		_	cloudy w/air >
1546	P	ZO AMY	2					
1600		Pump	5n	0	~45	lapm		
		75.1				7/		
Commen	ts:	N v.						-
	11	(6)		97.10	. ,			
				- 1				
			8		. +			

#### PUMP

Project Name: Excelsion	Project No.: 38681
Well No.: NSH -013	Date: 2-22-15
Location: NSH-® BW	Measuring Point: Top 5.7 1" PVC @ 3.1' ALS
Total Depth of Well (ft bls): 1070	Screen Interval (ft bls): Open 650-1070
Pump Type/Setting (ft bls): \$55200-18 @ \$69	Activity: Pump Development
How Q Measured: GFT Propeller 2"	H&A Personnel: C Price

Time	Discharge		Specific	Sand	рН	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level	Capacity	Content		(µmhos/cm)	°F	
47-47		(ft)	(gpm/ft)	(ppm)		2,144	- 46	
1605	40.12	774.31	_	40.1	_	_	-	Cloudy whair > clea
610	39.38	787,07	_	2011	_	)	_	cloudy wair > clear
615	37.58	797.24		26.1		_		cloudy w/air > clear
620	39.16	805.84	1	4011	-	}	-	cloudy wlair > clear
625	38.98	814.13	ł	26-1	_	į	-	cloudy w/air->clear
1630	39.80	820.45	1	20-1	-	)	)	cloudy what > alea
635	39.12	826.82	)	10-1	,	)	-	cloudy whir > clear
640	39.16	832.68	-	60.1	_	_	-	cloudy whir > clear
1645	39.18	836.95		10.1	-	- ,	į	cloudy w/giv > c/ear
645		Pump	053	<u> </u>				
700	,	Pump	σN		40 9	om.		
1705	40.77	810.41	-	40,1		_	_	cloudy wheir -> clear
1710	39.62	820.19	j	40.1	_		_	cloudy w/air -> clear
1715	38.71	828.54	-	40.1	-			cloudy whoir > clear
1720	39.01	836.11	ì	40-1	-	-	-	cloudy whair -> clear
1725	39.73	BU1.54	44-	20.1	_	· .		cloudy wlair > cl
1730	38,23	846.05		40.0	-	-	-	cloudy whair 7 elea
1735	36.12	851.07	+	20,1	_	_		cloudy whait 7 dear
740	37.14	855.00	_	40.1	_	_		cloudy while -> clear
1745	36.23	858.02	_	20.1	-	_	_	cloudy wais ->clear
								24102 - 20000 - 2000
						555		
	<u> </u>				<u> </u>			
	1			20581004	1		7.7	11000
Commen	ts:							
					722			46.2

## AIRUITO DEVELOPMENT FIELD DATA LOG

Project Name: EXCELSIOR	Project No.: 3868
Well No.: 195H-014B	Date: 1-9-15
Location: NSH-DN	Measuring Point: 708 OF CASSIG COT TO LAND
Total Depth of Well (ft bls): 1260	Screen Interval (ft bls): 1180 - 17100
Pump Type/Setting (ft bls): ATRUINE	Activity: AIRLIET DEVELOPMENT
How Q Measured: USUAL FROMATION	H&A Personnel: C. GATUNEL

<b>T</b>	D: I	B	0	I 01	-11	0- 0	Town	I Comments
Time	Discharge	Pumping	Specific	Sand	pН	Sp. Cond.	Temp.	Comments
4.30	(gpm)	Water Level	Capacity	Content		(μmhos/cm)	0	
		(ft)	(gpm/ft)	(ppm)		. 12	000	
1515	0	AIRL		15TA1		AD ~	800	FOOT-5 GREENISH
1525		5,514	nton	AT	rllt	7126	TURB	
1 <u>530</u>							BLAK	DISCHANGE
1530	+ 5th	IT DOWN	Of V	Lowe		BING	70 ~	1935 FEET.
1600	STAV		ruphi	UG , 1	+ BL	1 AFTE		MAN SUNGE
1615	12	TUNB.	D Gn	EGNIS	+ BL	ACK D	ISCHAR	45
1615+	- 0							
1630	~2	ATZLI	PINC	NO	501	GJ .	MINAMI	12 RENSIZI
11040	0	SHUT D	own,	AMLIF	7 10	Low	5	TURING TO SHOULS
1745	STAN	TOS AN	ULIFT	いて	~ 5	ypm ,	AFTER	かれるう
1750	3				DR	WINIE	H BU	ACK
1755				21	, ,			
1887)	405			The same				
18224	- 500	DOWN	MARK 1	7 7	234	NEOVI	3~~	
1-10-				1		7000		
0905		2125	4124	17	50571	W W	45 7	3 GPM
0910	2/	5,52	71.04	0:0	8.43	1130	21.2	TURBID GREENISH GAM DA
0915				-	J. C	-	_	VISUR ESTAMED RATE
0415	1			0.0	8.9	1130	21.1	ESTUATED USING MANT
0924		77101101	DRY	0.0	0.7	1130	2111	TO THE FMHORE CENT
				s- 0	1650	~ 20	0 / 20 5	
1925	HUT	130000	APRLIE	7 , K	7 ( G & U	-ca	GALL	DNS ON 1-10-15
						1		
		<u> </u>						
Comment	ts: 11/2	DO AI	21 11 ==					100
	110	DO MI	uno	_				

Project Name: EXCELSIOR		Project No.: 38681				
Well No.: NSH-015		Date: 1-16-15				
Location:		Measuring Point: 3.66 Ft Ladow, top of PVC (1")				
Total Depth of Well (ft bls): 820 F4		Screen Interval (ft bls): OPEN HOLE				
	053	Activity: PUMP DEVOLOPMONT				
How Q Measured: EM METER		H&A Personnel: K FORD, C. GARDNER				

Water Level (ft) Capacity (gpm/ft) (ppm) (μmhos/cm)	
least .	
(ft) (gpm/ft) (ppm)	_
601.45 YOUNGERS & ZORD STATIC WATER LOW	0
PING e ~ ZO gpm	
0612.00 0.51900 7.1 540 23.3 CLEAR	
60.15 2.3 0.0 7.1 570 73.5 CLOAK	
610.18 2.2 0.0 7.0 550 24.2 CLEAR	
610.25 2.3 C.O 7.0 SSO 24.5 CLEAR	
610.24 Z-3 0.0 7.1 560 24.3 CLEAR	
610.26 2.3 0.0 7.1 560 24.4 CLEAR	
610.28 2.3 0.0 7.0 550 24.5 (LOUDY -> CLEAR	
JAWE TO ~ 30 GAM	-
615.65 2.1 0.0 7.1 550 23.8 SLICHTLY CLOUDY TO CLEAR	
615.93 Z.1 0.0 7.1 560 424.3 SLIGHTLY CLOUDY TO CLEAR	
615.98 2.1 0.0 7.1 560 24.3 SLIGHTLY CLOUDY to C	20
615.95 2.1 0.0 7.1 550 24.1 CLBAR	_
615.98 2.1 0.0 7.0 550 24.1 CLOPR	
615.95 Z.1 0.0 7.0 560 240 CLEAR . 24.2°C	_
PONTO VALVO 1001 to ~ 33 gpm	
(017.00 2.1" 0.0 7.0 560 24.0 SUGHTL. CLOUDY TO C	20
617 99 20 0.0 7.1 580 23.9 COUDY TO CLOOK	_
618.01 2.0 0.0 7.0 560 24.0 CLEAR	_
618.01 2.0 0.0 7.1 560 23.2 CLEAR	
617 99 2.0 0.0 7.2 570 230 CLEAR	
RECOVER 10 MINS	
PUMPING, VALUE AT MAK	
616.67 2.2 0.0 7.2 570 223 CLEAR, 23.300	<u></u>
617.10 Z.1 0.0 7.0 560 23.9 CLEAR	

Project Name: Excalsion	Project No.: 38681
W 11 No. 14 4.01/2	Date: 1-11-15
Lucian AVGH . CI	Measuring Point: 70P OF 1" PC & 3.57 Fr dis
Total Depth of Well (ft bis): 820 FT	Screen Interval (ft bls): OPEN 579 - 820'
Pump Type/Setting (ft bls): 40BM6n51Bi6e653	Activity: PUMS DEVELOPMENT
How Q Measured: EM Frow	H&A Personnel: C. GANDABA, K. FONDA
How Q Measured: Or 1 2000	

Time	Discharge	Pumping	Specific	Sand	рН	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level	Capacity	Content		(µmhos/cm)	** *C	
		(ft) bmb	(gpm/ft)	(ppm)			-0	1001 100
350	0	605.10	~				-	STATIC WATER LOUGE
355	STA	LITER A	MPING	, e		Mal		
400	?	610.55			6.9	580	22.4	CLOUDY (Meter clogged)
100+	0	SHUT I	MUC	TO C	BAN	Frow	MOTOR	
107	START	ED PUMPING	~ ~ ~	O GPM		(2)		
410	19.07	607.79	7.1	<<0.1	7.0	590	23.5	CLOUDY FEW BLACK PARTICLES
415	HAD T	O OPEN V	TWE TO	FLUSH			31	
419	BACK	AT ~ 206	PM					
425	20.08	608.20	6.5	440,1	7.1	580		SCIGHTLY CLOUDY, FEW BLACK PARE
1430	70.08	608.23	6.4	<<0.1	7.1	570	23.5	SLIGHTLY CLOUDY TO CLEAR
440	20.02	608.32	6.2	0,0	7.2	580	23.4	CLEAR
1450	70.14	608,38	6.1	0.0	7.2	580	53.3	CLEAR
1500	20,02	608.43	6.0	0.0	7.2	580	23.3	CLEAR
1502	ADJUST	VALVE TO		PM				
1507	29.88	610.61	5.4	«O.1	7.2	580	23.4	CLEAR, FEW SAND GRAINS
1512	29,94	610.68	5.4	KO.1	7.1	570	24.1	CLEAR FEW SAND GRAINS
1522	29.98	610.76	5.3	K20,1	7.2	570	23.8	Sciently abody white, Few 5
1532	29.99	610.88	5.2	<<0.1	7.3	580	23.4	SLIGHTLY CLOUDY WHITE FEW SA
1542	30.04	610,98	5,1	<<0.1	7.2	570	23.3	SLIGHTLY CLOUDY -> CLEAR FEW S.
1552	30,10	611.02	5.1	0.0	7.2	580	23.4	SLIGHTLY CURUSY & CLEAR FREE
1602	30.10	611-11	5.0	0.0	7.3	580	73.3	SCIENTY CLOUDY -> CLEAR
1604	ADJUST							
1609	33.66	617.05	4.8	0.0	7.2	580	23.3	SLIGHTLY CLOUDY -> CLEAR
1619	33.82	612.17	4.8	«O.1	7.2	580	72.9	SUGHTLY CLOUSY -> CLEAR, FEW
1629	33.72	612.26	4.7	0.0	7.2	580	23.1	CLEAR
1639	33.88	612.31	4.7	1.0>>	7.2	570	23.0	CLEAR, FEW SAND GRAINS
1641	0	RECOVER		MINS	1			
1653		1	MAX					
1658	34.10	611.88	5.1	0.1	7.2	580	27.5	SLIGHTLY CLOUDY, SOME SAND
Commen		מט יווע		*.	-	AP 44	22 6	SLIGHTLY CLOUDY FEW SAND
1708	33.88	612.08	4.8	440.1	7.2	280	22.5	SLIGHTLY CLOUDY FEW JANE
1718	33.72	612-18	4.8	(CO.1	7.2	280	22.6	SLIGHTEM CLOUDY TO CLEAR FE

Project Name: EXCELSTOR	Project No.: 3868 1				
Well No.: NSH-017	Date: 1-6-15 3.47'				
Location: NSH * CK	Measuring Point: TOP OF 1" PUC, 33 6hckup				
Total Depth of Well (ft bls): 1200	Screen Interval (ft bis): 940 - 1/80 A				
Pump Type/Setting (ft bls): Susmises is LE 926 bls	Activity: PUMP + SURG€				
How Q Measured: GPT From METER	H&A Personnel: KEJDRA FORD				

Temp. Time Discharge Pumping Specific Sand рН Sp. Cond. Comments Capacity °C (gpm) Water Level Content (µmhos/cm) (gpin /Ft) (ft) BMP (ppm) 1800 598.30 STATIC WATER LEVEL 598.34 STATIC WATER LEVEL 0600 STARTED PUMPING ADJUST VAL 0610 601.24 440,1 7.5 5.24 1.8 350 70.4 CLOUSY, GREYISH WHITE (AIR) 0614 1.9 0620 5.42 LO1. \$3 KG. 1 7.3 370 22.6 CLOUDY GREY 1.9 601.15 440.1 7.2 0625 5.42 450 22.8 GOUSY, GREY LLO,1 7.2 23.1 0630 5.47 1001.14 2.0 470 GOUDY GREY 0635 5.52 2.0 40.1 7.2 480 22.6 CLOUDY GREY 601.16 7.3 40.1 480 0640 5.52 601.15 2.0 22.6 CLOUDY GREY 0646 VALVE TO ~106PM ADJUST 0648 0 STARTED PUMPING 0700 2.1. 7.3 480 21.6 0705 10.44 0.1 CLOUDY, GREY, SOME BUCKPLESTELES 603.42 480 0710 10.50 603.35 2.10 20,1 7.3 23.1 (LOUDY, GREYISH BROWN 0715 7.2 470 24.3 10.50 40.1 1,03.37 2.1 CLOUDY -> CLEAR 440.1 470 SLIGHTLY CLOUDY -> CLEAR 10.44 7.2 24.7 603.41 2-1 0720 40.1 10.38 2.1 7.3 490 24.3 SLIGHTLY CLOUDY -> CLEAR 0725 603.38 40.1 2.1 7.3 24.4 10.44 663.37 500 SLIGHTLY CLOUBY -> CLEAR 0730 0733 ADJUST VALVE TO ~15 GAM 0734 0 STARTED PUMPING 0750 CLOUDY GREYISH BROWN, AFEN BLACK 0755 15.00 605.56 46.1 460 23.8 2.1 7.3 480 25.2 0800 15.00 605,58 2.1 40.1 7.2 Sciencey acuby -> CLEAR 15.00 10.1 470 25.4 0805 605.66 7.7 CLEAR 2.0 0814 15.00 605,72 7.0 CL 0.1 7.2 480 25.6 CLEAR 460.1 480 15.00 605.77 2.0 7.2 26.0 CLEAR 0816 25.9 0820 40.1 CLEAR 15,00 2.0 7.2 480 605.67 0824 ARJUST VAKVE TO ~ 206AM Comments:

1-6-15

Project Name: EXCELS TOR	Project No.: 38681
Well No.: NSH-017	Date: 1-7-15
Location:	Measuring Point: TOP OF 1" PVC PIPE 3.47' Shicking
Total Depth of Well (ft bls): 1200	Screen Interval (ft bls): 940 1180
Pump Type/Setting (ft bls): SUBMERSIBLE 1976 bls	Activity: PUMP + SURGE
How Q Measured: GPT From METER	H&A Personnel: KENDRA FORD

SIATIC : 598.34

Time	Discharge	Pumping	Specific	Sand	pН	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level	Capacity	Content		(µmhos/cm)	°F	
		(ft)	(gpm/ft)	(ppm)				
0878	0							*
0841		NG -2081						
0845	20,41	609.24	1.9	40.1	7.3	470	25.2	SLIGHTY CLOUDY GREY
0850	20.46	609.27	1.9	<0.1	7.3	490	25.7	CLEAR
0855	20.36	609.34	1.9	(0.1	7.2	470	25.7	CLEAR
0900	20.46	609.37	1.9	٥	7.2	480	26.1	CLEAR
0905	20.52	609.34	1.9	0	7.2	470	75.9	CLEAR
0910	20,46	609.35	1.9	0	7.2	480	26.3	CLEAR
0913	ADJUST	TNG PUM	P					
0914	0							
0932			-25 gp~					
0936	25.13	611.21	2.0	46.1	7.3	500	25.5	SLIGHTLY CLOUDY -> CLEAR
0944	25.02	611.43	1.9	0	7.2	480	26.0	CLEAR CLEAR
6946	25.02	611.65	1.9	0	7.2	480	26.2	CLEAR
0951	24.96	612.04	1.8	0	7.2	490	26.4	CLEAR
0956	24.96	612.25	1.8	0	7.2	490	26.3	CLEAR
1000	ADOUST	TING PUMP	TO MAX					
1001	0							
1010	START	PUMPING	- 30 gp	~				
1015	36:71	616.64	1.7	460.1	7.3	490	26.1	SLIGHTLY CLOUDY
1020	30.76	617.55	1.6	0	7.2	480	26.4	CLEAR
1025	30.71	618.21	1.5	0	7.2	490	26.3	CLEAR
1030	30.71	618.71	1.5	0	7.2	990	26.5	CLEAR
1035	STOP PUN	APING PL	4 PIPE	TO N.	700 Ft			
		9 ×						
Comment	ts:							*.

Project Name: Excelsion	Project No.: 38681				
Well No .: NSH -017	Date: 1-7-15				
Location:	Measuring Point: TOP OF 1" PUC PIPE, 3.45 A Stideup				
Total Depth of Well (ft bls): 1200	Screen Interval (ft bls): 940 - 1180				
Pump Type/Setting (ft bis): SUBMERSBLE 713 bis	Activity: PUMP + SURGE				
How Q Measured: GPT FLOW METER	H&A Personnel: KGNDRA FORD				

Time	Discharge	Pumping	Specific	Sand	pH _	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level	Capacity	Content		(µmhos/cm)	1×	
		(ft) BMP	(gpm/ft)	(ppm)			oc .	
8111	0	604.65						
1120	START	PUMPING.	MAX					2
1125	32.54	620.74	1.5	240.1	7.7	300	26.5	SLIGHTLY CLOUDY GREY
1130	32.54	621.22	1.4	<0.1	7.6	440	26.6	SCIENTY CLOUDY GREY
1135	32.44	621.63	to 1.4	20.1	7.4	490	26.5	clear
1140	32,49	621.84	1.4	0	7.3	490	26.5	CLEAR
1144	STOP	PUMPING.	RECHAR	66				94
		· ·						
1230	0	665.32						• 1
1233	START	Pumping	ADJUST	JALVE	- 10	GPM		Ś.
1238	10.06	610.07	0.9	40.1	7.8	470	25.7	SLIGHTLY GOUDY GREY >a
1250	10.06	610.09	0.9	440.1	7.2	500	25.7	CLEAR
1300	10.11	610,19	6.9	0	7.2	490	26.2	CLEAR
1310	10.11	610.31	0.8	0	7.2	500	1626.5	CLEAR
1320	10.11	610.40	0.8	40.1	7.3	490	76.5	CIEAR
Α	DJUST	VALUE T	0 206	PM				
1325	20.36	615.35	1.2	0	7.2	490	26.8	CLEAR
1335	20.30	615.73	1.2	0	7.2	500	76.4	CLEAR
1345	20.41	615,96	1.2	0	7.3	500	26.5	CLEAR
1355	20.36	616.14	1,1	0	7.3	510	26.5	CLEAR
1405	20.30	616.32	1.1	0	7.3	490	26.3	CLEAR
AT	STUST V	ALVE TO	MAX -	~ 3761		Py		A TOTAL STREET
1410	31-54	627.28	1.3	0	7.3	500	26.1	CLEAR
1420	31.44	622.73	1-3	0	7.3	500	26.2	CLEAR
1430	31.49	623.08	1.3	0	7.2	500	26.3	CLEAR
1440	31.60	623.23	1.3	0	7.3	500	26.4	CLEAR
1450	31.49	623.36	1.3	0	7.3	520	25.7	CLEAR
51	OP PUM			-	. 1			
		- 4	781.4	= 3±3	P			
Commen	ts:		13		3			
		× (2)			**	100		
	- 1		1		-			1 to
			-		7		to garage	The All The Table

## PUMP

#### **DEVELOPMENT FIELD DATA LOG**

Project Name: EXCELSION	Project No.: 38681
Well No.: NSH-017	Date: 1-27-15
Location: NSH-CK	Measuring Point: 78P OF 1" PVC @ 3,24 Frais
Total Depth of Well (ft bls): 1181	Screen Interval (ft bis): 940 - 1181
Pump Type/Setting (ft bls): GNUNDFDS / 931	Activity: PUMP DEVEROPMENT
How Q Measured: EM FLOW MOTERS	H&A Personnel: C. GARDNET

Time	Discharge	Pumping	Specific	Sand	рН	Sp. Cond.	Temp.	Comments
Time	(gpm)	Water Level	Capacity		pri	(μmhos/cm)	2F	Comments
	(gpiii)	(ft) bmP	(gpm/ft)	Content (ppm)		(шинов/сии)	°C.	
1513	^	598.ZZ		AUZ	en e	0.0		WATER LAVEL
515	STANT			2409		0,0	71/1/2	C. 110 10. 10. C
1519	82.58	655.00	170	0,1	6.85	451	21.1 -	TURBIO GREEN al By
520	80.72	054.67	_	0.250	The second second	466		TURBIS BROWN
522	81.36	655.20	_	0.20	6.91	499		TURSID-CLOURY, MOUF 18
526	80.40	1056.35	1,4	0	6.97	207	23.4	CLOUDY-CLEAR, NTU=42.9
531	8604	057.09	1.4	0	7.00	507	23.5	CUBAN NOUS 11.4
1536		657.84	14	^	7.09	504	23.2	CLBAR, NOTUE 144
541	80.72	658.14	13	0	7.0	508	73.6	CLEAN NOU = 14.8
1541.	80,88	658.44	1.3	0	7.09	508	73.6	CLBAN, NOV= 7.20
551	20.88	658,80	1.3		7.07	505	23.4	66An, NOUS 5.45
	81.04	659.14	1.3	0	7.06		72.7	CLEAR, NTU = 5,70
550	8182	1059.35	1-3	-	- 00	-	-	-
1610	81.82	559.80		-	_		_	
1620	82.28	<i>560.08</i>	_	-	-	_ *	_	
	80.88	660.31	1.3	0	7.08	505	23.4	CUBAR , NTU = 3.83
626	80.88	(000.74	(,)	0	7.00	200	-	CO. 11C 1 11 21 21 21
450	2 2-2	(dol. 02	_		_	- /		
700	0.00	1 ( 1 110	1.3	0	7.07	504	23.7	CLEAR, NTU=2,35
715	80.72	661.45	1.3	0	7.07	502	23.1	CLBAR, NTU= Z.76
1740	81.36	662.03	-	_	-	-	-	West 12, 1010 2, 10
750	80.93	600Z.15	1:3	0	7.09	502	22.7	CLEAR, MU=3,41
- 100	81.82	1062.28	1.0	-	-	-	-	Covic, Mar 21 11
800		1000.00	1 412					No. of the second
BOZ		593.00						
804	0	591.65				//* - T		
1808	-	598,00						
	0	603:10						
1810		Drw Fr	bmp					
	ts:	NSH-015	NSH 1	016 1	SUAW PO	nno	1/28h	Se NSH-017
commen	1330	600.90	Coott.		0		DTW	598.48 + Tomp e1013
commen	, 200				0		, ,	
	1335	-	604.7				1 / 10 /	
	1335				0			a NSH-015
Commen 1516		602.64	1004.		0,74	(		601,00 trbmp & 1016
	1335	-	1004.		0,74			

PUMPING !

1742 602.88

FUNDING K:\Templates\Fjeld\Forms\Well\Inst\&\ Testing\Forms\xls\\ G01.860\\ 1823\\ (601.460\)

HALEY & ALDRICH

Project Name: EXCELSIOR	Project No.: 3868 I
Well No.: NSH -018	Date: 1 - 9 - 15
Location: NSH CV	Measuring Point: 3.38 F4 above surface
Total Depth of Well (ft bls): 997	Screen Interval (ft bls): 610 - 990
Pump Type/Setting (ft bls): SUBMERSIBLE 700	Activity: (PSEUDO) STEP TEST
How Q Measured: GPI METER	H&A Personnel: KENDRA FORD

Time	Discharge	Pumping	Specific	Sand	рН	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level	Capacity	Content		(μmhos/cm)	9F	
		(ft) BMP	(gpm/ft)-	(ppm)			°C	
303	0	594.80		11/914				STATIC
307	STAME	PUMPING,	ABJUST		TO ~	206PM		
1313	21.42	597.22	8.9	20.1	7.6	430	27.3	SLIGHTLY CLOUDY - CLEAR BROW
1318	19.34	596.92	9.1	< B.1	7.3	390	23.7	tt
1323	19.34	596.88	9.3	<0.1	7.3	320	24.1	CLEAR (WHITE AIR)
1328	18.90	596.80	9.5	20.1	7.4	400	23.6	CLEAR
1333	18.90	596.81	9.4	<0.1	7.3	390	24.2	CLEAR
1339	18.80	596.78	9.5	1.03>	7.3	380	24.1	CIEAR
1348	HAD TO	OPEN VA	VE TO F	LUSH -	EQUALI	ZER NOT	WORKI	46
1350	19.57	597.00	8.9	<0.1	7.3	410	24.7	CLEAR
1400	17.11	596.70	9.0	<0.1	7.2	370	24.9	CLEAR
1405	16.28	596. 44	9.9	0.1	7.3	380	24.6	CLEAR
1415	15.72	596.38	9.9	£0.1	7.3	360	24.8	CLEAR
1425	15.67	596.32	10.3	40.1	7.3	370	24.3	CLEAR
435	15.45	596.34	10.0	<0.1	7.2	400	24.9	CLEAR
1436	ADJUST		10 ~30	6PM				
440	30.66	598.81	7.6	0.1	7.3	370	24.8	CLEAR
1446	HAD TO	OPEN VAL		WSH -	_		F	
1447	30.04	599.40	6.5	40.1	7.2	360	24.9	CLEAR
145Z	29.66	599.04	7.0	<0.1	7.2	380	25.2	CLEAR
457	29.26	599.04	6.9	20.1	7.3	380	24.4	CLEAR
502	79.32	599.14	6.8	40.1	7.2	370	25.2	CLEAR
507	79.21	599.14	6.7	40.1	7.2	370	25.2	CLEAR
1512	29.21	599.12	6.8	<0.1	7.2	380	25.2	CLEAR
522	MAD TO					By Str.		
				<6.1	7.3	390	23.9	CLEAR
						390		
				40.1		400		
522 538 1548 1558	30.38	599.61 599.58 599.55	6.3 6.3 6.3	<0.1 <0.1	7.3	390	23.9	CLEAR CLEAR

## PUMP DEVELOPMENT

## **FIELD DATA LOG**

Project Name: EXCELSIDE		Project No.: 38681			
Well No.: NSH -018		Date: 1-9-15			
Location: NSA-CV		Measuring Point: 3.38 F+ bls			
Total Depth of Well (ft bls): 997		Screen Interval (ft bls): 610 - 990			
Pump Type/Setting (ft bls): Susmers, BLE	700	Activity: (PSEUDO) STEP TEST			
How Q Measured: GPT METER		H&A Personnel: KENDEL FORD			

	10:594		0!#-	0	-11	0-01	T	2
Time	Discharge		Specific	Sand	рН	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level	Capacity	Content		(µmhos/cm)	°C	
1608	79,99	(ft) 599.55	(gpm/ft)	(ppm)	7.2	390	24.5	CLEAR AND A CON
			6.2	20.1	7.3	400		CLEAR, MINOR SAND
1618		599.59					24.1	CLEAR
1628	29.54	599.60	6.2	<0.1	7.3	390	27.5	CLEAR V
1632	35.61		14x -	<0.1	7.3	1,10	24.1	CLEAR II I SAIN
1635	35.66	600.46			7.2	380	25.1	CLEAR MINOR SAND
1640	35.61	600.74	6.0	<0.1		380	25.1	CLEAR
1645	35.50	600.80	5.9	40.1	7.1	370	25.2	CLEAR.
1650					701			CLEAR
1655	35.66	600.88	5.9	<0.1	7.1	380	25.0	CLEAR
100	35.56	600.93	5.8	40.1	7.2	400	25.0	CLEAR
710			5.7	<0.1	7.3	390	23.8	CLEAR
720	35.66	601.02	5.7			380		CLEAR
1730	35.72	601.08		<0.1	7.2	2 50	23,9	CCCAR O
1733	0	STOP PU	MPING.					
-								
					N-			
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omment	ts:							
	-							

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Page	/_	of	/

Project Name: FaxCalsia- EN NNI SON	Project No.: 38681 - 245
Well No.: 1/5/4-018	Date: /2/20/14
Location: G, of I-10 @ THE THING	Measuring Point: TOD OF STEEL 1.11 ALS
Total Depth of Well (ft bls):	Screen Interval (ft bis):
Pump Type/Setting (ft bls): 656/44 GuB	Activity:
How Q Measured: BAN Bucket	H&A Personnel:

7DS

Specific Time Discharge Pumping Sand рН Sp. Cond. Temp. Comments (gpm) Water Level Capacity Content (µmhos/cm) °F (gpm/ft) (ft) (ppm) 1634 29 UTM 39 1710 02 0000 OFF 1010 hovies 410 154 190 DARRING MEAS, AFFER 1109 OTT 25 the rellection, KITWAG NOT ONSITE 140 on 200 OFF 1215 on OFF 1220. 1230 ono 020 1736 ON 1741 OTTE 1246 HOPEN'S TO BE RED Algae 1251 on FENY 5 1296 ODE on 1302 50 1307 0190 2.0 1312 023 DE 13/7 1330 ON 1335 arr 1340 Cyc 0.5 OFT 1345 1350 052 000 V355 POV Purp

12/21

#### ARLIFT DEVELOPMENT FIELD DATA LOG

Project Name: BXC62-516-1	Project No.: 38681
Well No.: N5H-019	Date: 2-9-15
Location: NSH - DP	Measuring Point:
	Screen Interval (ft bls): OPEN 638-1300
Pump Type/Setting (ft bls): ARLING	Activity: ARLIFT DONORDOMONT
How Q Measured: USUAL BSTIMATION	H&A Personnel: C. GANNEN

Time	Discharge	Pumping	Specific	Sand	рН	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level	Capacity	Content (ppm)		(µmhos/cm)	°F	
		(ft)	(gpm/ft)	"(ppm)"		154-140		
1405	STA	MUTES _	AIRLLE	7116	FU		900 7	7507
410	155	]		0	7.64	462	21.3	CLOUDY 54.8WW
420	735	<u> </u>	_	20.1	8,04	461	21.7	CLEAN-CLOUDY 37.3
430	255	وست		401	8.09	450	21.5	CLEAN - 16NTU
1440	~55		_	40.1	8.4	446	21.5	CIBAN, 9,18 NO
14401	0		_	NO 01	- 00		55, 47	TAL RESIDUAL
				Citre		= 0.00	H ngs/C	
		DESCHANC	TO INF	Laws	60 A	NON TO	AW 4	151A
1450	Low	5ning	AIRC	NE	40	100	0 75	67
510	STASE	TED A	RUFT	146	From	nnn	100 F	<del>ठिठे</del> र
1510	160	-	-	0.1	8.04	440	21.1	TURRID, 745 NYU
1520	260	<u> </u>		22	8.04	436	21.1	Croust - CLEAR 61.81
1530	260	_		<0.1	8,00	441	21.9	Coson, ZB, Zwn
1545	160	~		201	8.08	439	21.9	CLOUDY-CLEAN, 50.0N
555	reo	-	-	201	808	444	22.6	CLEAR, 16.4NTV
1600	160	-	_	80	8.09	440	21.9	ason, wis now
1005	0	STOPPE	D ANZ	UST	TOTAL	REGOD		1 - 11 - 11 - 11 - 11
					100	IC OR	GNERS	50
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L								
						1000		
		<u> </u>						
Comme	nts:							1
							_	

	Project No.: 38681
Well No.: NSA - 0 ZO	Date: 1-8-15
Location: NSH-CX	Measuring Point: TOP OF 1" PUC & 3.4 PT STICKUL
Total Depth of Well (ft bls): 1582	Screen Interval (ft bis): 1060 - 158 Z 3 1075WAS
Pump Type/Setting (ft bls): 50 3 musi GLE & 705	Activity: PUMP AND SUNGO
How Q Measured: Em From MOTON	H&A Personnel: C. GANON ST

Time	Discharge	Pumping	Specific	Sand	рН	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level	Capacity	Content		(µmhos/cm)	eF.	
		(ft) WMF	(gpm/ft)	(ppm)			oc.	
1100	0	607.55				STA	Ne w	ATEN LEVEL
1116	SIM	WB A	mpin	0 15	VE BL	ALL DAM	nuos	
1120	5.60	608.3		46.1	8.0	260	18.8	PURBAD GARY W/ARZ
1127	0	606.1		CLEAN	0.0 8.4	230	21.1	GRUNNS TO CODUST GAR
128	0952	GS VAL	v5 10	0% V	150 M	~ 5gg	M	
128	t 5th	TDON	N			J		
	CHE	KOS 6	ELM		NEZ		U. 3	(000D
140	PUMP	100,00	LUE	100%	OPEN	J	J. S. L.	+ TALL NATIONAL SECTION
144	700		1165	54.				
148	Puns	1000 ~=	0 4		4PM	ADJU	वंद्याहर	0 10
1					3			
				11-		2.44	000	
					1 FINS	BLALL	PANTICO	
150	12.43	609.8	- 6	440.1	8.8	230		TURBIO GARY - CHONOT CO
153	Diga	MGE N	no 1	propp.	26	10 <0	il ger	
153	Fund	OFF	1					The state of the s
159	Punp	ING, VA	NF 10	0/ 095	NA	33 gpw		KING FINE TO
	A	Byum 3	no-	5128	BLA	IX BAR	TICLES	
	/	APPEAR T	0 85	Rou	CATI	16. MM	HAVE	= CAUSTO
		PUMP 155	U53	€ 00		ATES		and PANDELES (E
1204	612.9	33.55		640.1	8.5	450	21.8	TURBID LIGHT BUOWN
209	210.0	0						FLUENCETTES U/TINO O
1209	413.2	360 Cel3 2	6.4	0.0	8.2	520	22.8	TURBITO GOUDY UT, A
1215	36.00	613.3	4:3	0.0	7.7	430	25.0	CLOUDY, LT BROWN
221	36.06	613-40	6.2	0.0	7.5	430	25.40	SLOUDT WI AR WANS QUO
230	35.66	413.42			7-3	430	ad	In, CIGHT Brown
0230	35.66	6013.42	61	0.0	7.3	430	24.7	CLOUDY W/ ALR > CLOUDY-6
237	35.66	613.46	6.0	0.0	7.4	430	23.60	ti n a
	-							The second secon
Comment	ts:							
			-			1 43		
					1 1			
							100	
4					7.1			

Project Name: Excelsio V	Project No.: 38681
Well No.: N5H-020	Date: )-8-15
Location: NS14 - CX	Measuring Point: Top of 1" PUCE 3456 5th
Total Depth of Well (ft bls): 15 % 2	Screen Interval (ft bls): 1060 - 1582, 3 in tervals
Pump Type/Setting (ft bls): Submergen @ 700'	Activity: Pormo + 5 wap
How Q Measured: EM Flow meter	H&A Personnel: C Gardner, / Price

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pН	Sp. Cond. (μmhos/cm)	Temp.	Comments
1905	35.72	613.64	5,9	0.0	7.2	420	24.6	devolve wair or clear
1315	35.61	613.64	5,6	0.0	7.2	400	24.2	cloudy what -> cleans
1325	35.16	613.67	5,5	0.0	7.2	410	24.9	cloudy w/air -> clear
330		Pump &	FF. 1	etting	vecl	nargo	For	15 min.
340		Turned	pum	on	. 4	couldn'	't act	oums to
tary,		act mor	p th	an	5 OPV	n & bo	uncina	ground,
		Drillers		Na Do	o gun	于至	1	
13.55		599.35	TV	VER PUMP	· Ocel	con		
1357	33,32	633.95	1.3	2011	7.5	470	19,4	cloudy very light brown
1403	32.10	630.20	1.4	66 0.1	7.3	450	21.9	cloudy light brown
1411	33.10	628.70	1.6	0.0	7.1	430	25.0	cloudy wair -> clear
1417	31.88	634.75	1.2	0.0	7,2	410	24.8	Cloudy with air > char
1426	31.44	634.78	1,2	0.0	7.3	440	23.9	cloudy with air -> clear
1434	31.72	634.38	1,2	0,0	7.1	440	24.6	clear
1443	31.72	634.66	1.2	0.0	17.3	450	23.4	Clear
1445		RUMEN	与工工					
		1						
		7 3 8	7			100 A A		
	N							
					to 1 3			
					+ - 1			
	1					-0-		
				8.				
				7 6 1				
			.50 -	1	dia.			
Comment	ts:							7 /
							8, "	
							2.0	

NSH-08; = 720-846 saccon
NSH-09=813-995'
DEVELOPMENT
FIELD DATA LOG

## FIELD DATA LOG

Page / of / SWL= 604.40' BTC NLS

Project Name: Fruision	Project No.: 3 9 68/ - 205
Well No.: NSH-020	Date: /1/22/14
Location: S. S. R. F I-10	Measuring Point: TOP OF CAGING N_LS
Total Depth of Well (ft bls): 1600	Screen Interval (ft bls): 1060 to 1582 / 211
Pump Type/Setting (ft bls): N △	Activity: SWABBING
How Q Measured:	H&A Personnel: & F

Time	Discharge	Pumping	Specific	Sand	рН	Sp. Cond.	Temp.	Comments	
	(gpm)	Water Level	Capacity	Content		(µmhos/cm)	٩F		
		(ft)	(gpm/ft)	(ppm)					
0800	NA							SWABBING BEGINS	5
1005	NK								
		TOO DE	EP to	But	-est	ech reli	2		_
					00		7		_
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#### AIRLIGE DEVELOPMENT FIELD DATA LOG

Project Name: GREBISION	Project No.: 38681
Well No .: NSH-OZI C	Date: 1-30-15
Location: NSU-DB	Measuring Point:
Total Depth of Well (ft bls): 1404, FILTO 1372	Screen Interval (ft bls): 0750 623 - 1372
Pump Type/Setting (ft bls): Ancies, Vanuss	Activity: ARCUT DOUGLOPMENT
How Q Measured: USUAL GRANTS	H&A Personnel: C. GANONON

Time	Discharge	Pumping	Specific	Sand	рН	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level	Capacity	Content (ppm)		(µmhos/cm)	°F	
		(ft)	(gpm/ft)	(ppm)				
1425	~25	STANTE.	ARREL	FT F	com ~	900 F	记 4	0.1 SAND. 188 NO
1435	~25	-	-	04	FN-MU	3175	TURBI	D. 401 NOU
1440	125		-	0.1	u		cias	
1445	~25	~	-	0.2	FN-COS	SANDS	1200	CIOUDY-CIGAN
					600		ت عرب	> ABILIO 32,3 NTV
1450	~25	_	1	0.1	5170D	FE-OXI	005	CiBAN, 24.ZNTU
1450t	. 0	SUNGE NE	500 DER	TOTAL	ctions	NE -0,0	I WO OI	1 2 GREASE, 0.04mg/2
1500	~35	STANTED	Anuvi	-0.1	FINES	TULES ZE		DY-CLEAN 35, INTO
1510	~35		1	20.1			co	UDT-CLOTAN 37.4 NOW
1515	~35	-	-	20.1	Pan Tic	28.46	it cu	BAM, Z3.0 NTU
1520	~35			20.1	7.63	428	20,1 C	LEAR, LG. 9 NTU
1520-	+ 5TOF	PES AN	ZUET	, INST	MING	Any	NE T	0 ~ 1000 FGGT.
1550	~75	TRAKE GAD	SAN PAR	0.2	ciou	07 70	CUSA	R 63.8 NW
		ABRIGOLW	446+61186	<b>1</b>				
1555	275	XI .	1	0.1	-	ĺ	CLISATO	, 20.5 NTU
4000	275	11	1	20.1	1	1	CLG	tn 14,2 No
1610	~75	FIVESAND	35120	20.1	1	1	CLEA	n. 10.3 NTU
Malo t	0		RECOVE	18				
1620	275	STANTE	5 An	LIPT				
4030	275	FING-MES	SAVO	0.1	_	1	Ció	AR, 22,7 NTU
1640	275	FINE SAND	~51そのひ	201	-	1	ocie	An. 10.00 NTU
1650	275	FINE SAND.	51200	201	7.32	429 2	,3°CLG	An 7.8 m
16504	r (2)	50,246	RECO	くゆう	_	(		t
1700	275	STAME	> An	JET				
1705	275	-	-	20.1	į	1	- CLÉ	AM, 15.7 NTV
1715	~75		1	20.1	1	,	- a	ESN 832 NTV
1725	~75			401	)	-	-	CLEAN CO.79 NOV
1727	SHUT	Dones	An	-12				8 1
Comment	s:							
- 7.7					-			

Project Name: Excelsion	Project No.: 39691
Well No.: <i>N 5</i> H‐0aa	Date: 1-20-15, 1-21-15
Location: NSH - BF	Measuring Point: LANS
Total Depth of Well (ft bls): 130	Screen Interval (ft bls): 1/30 -1010
Pump Type/Setting (ft bls): ARUFT, VANUOUS	Activity: AIRLIGT DEVEZOPMENT
	H&A Personnel: ( Price

Time	Discharge	Pumping	Specific	Sand	pН	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level	Capacity	Content		(µmhos/cm)	°F	
-11-		(ft)	(gpm/ft)	(ppm)				
1935	Trem		602	- Pum	ped	head o	J m	vd out t
	th.		wate.	NOV	ped	lon.	•	2
1515	Trem	ire @	800	Pin	ped	head	05 N	rud +
	1 .	then	~ 5 97	m 03	wat	er, 10	rbid.	
1530	~lgp		٧,			102	0	3-
1540	0	NSTALL	1116	MOMI	E 70	~100	O FEE	TT,
1-21-	15					2		
0900	~2	SMATTE	int as	RUFT	Fn	om ~	1000 F	861
0945	0	SULLE		OVER	1			
1000	21	TUR	BID	<0.1				TURBID BROWN
1045	0			<01			_	TURSID, Brown
1100	~ 1			40.1				TUNGO, Brown
1145	0			, .				
1200	21			20.1				TURBO, Brown
1300	0	SHUT	Down	P R	DUING	ARCU	N5	,
				·				
		-						
						is a		
				,				
		110						,
Comment	s:							
	18.							

Project Name: Excelsion	Project No.: 38681					
Well No.: NSH-22	Date: /- 2 2					
Location: LOCHISE COUNTY	Measuring Point: Topof Sounding tube, 1.5 als					
Total Depth of Well (ft bls): //30	Screen Interval (ft bls):					
Pump Type/Setting (ft bls): Grandles	Activity: Pump development					
How Q Measured: GPT From Moren	H&A Personnel: Jlak					

Time	Discharge (gpm)	Pumping Water Level	Specific Capacity	Sand Content	pH	Sp. Cond.	Temp. °F	Comments
	(gpiii)	(ft) BMP	(gpm/ft)	(ppm)				
440	0	563.43						Recovered water level
1440+	10.66			10ml/c Fin	res, turbi	d Grey.Bas	IN,	PUMP ON,
448	9.67	~667						
1458	7.79	725,90						
1508	5,74	777,55						
518	4.42	813.90 837.50 855.26						
1528	2,48	837,50						
	1.0	855.26		40 ML/L	, tubid	, Grey B	OWN	
1540+								Open valle 10100%
1545	-110	861,32		125m4	, twbi.			
1545+								Pump off, low flow
1615	0	783,53			75 ml/c	I've sund		
1615	3,83							Beging Pumping
1645	-# 1.0	368.48			60 mL/L	fine send		
1645								Pump off
715	0	788,94			Gre	y Brown,	hibid	Pump or
1745	~ 1.0	269,55						
1745 H	0							Ring off.
								100
<b></b>								
Comment	is:							

Project Name: Exc(sic/	Project No.: 3 8681
Well No.: NSH-022	Date: 1-23-15
Location: Cochese County	Measuring Point: Top of Sounding tube 1:5 %
Total Depth of Well (ft bls): 1130	Screen Interval (ft bls): 10(0 - 1130
Pump Type/Setting (ft bls): if you tos -900	Activity: Pump Development
How Q Measured: GPT From MENER	H&A Personnel: 5 Cook

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pН	Sp. Cond. (μmhos/cm)	Temp. °F	Comments
0645	0	651,35						Recovered Water level
264St	19.62		DK, Braun,	turbid, S	one some	d settle on	t.	Begin Pumpins
7745		868,55	Brown,	turbid,	less	Fine M.	iteric/	
2745+	0		,	,				Pump OFF
0845	6.42	773.72		0.4 2/	Fires, lig	Later Color, 7	urbild	Begin Pumping
0915	21			Tan/	1/ght B	roun, tais	₽ .	Begin Pumping
3920.		867,71			1			
1930	1.25				E			Sgallon Budet Flow Rute
	~(			light	Brown, +	419:0,		continue purpos
6950	~ (	868,83						Continue purplas
0955	21			Water	color is	becoming	lighter	le 4
040	~1	868.59		color con	tinging	to clow up		м "
i lo	~1	867,95						(1
1130	11	867.75						Y 1
1155	l							5 gallon bucket Flow Rate
1230	1	867.60	7					continue purping
250	1	966,10	1					
1250+	0							Stop Pumping
755	0	798.85						Recovery
1300	0		- No					,
1305	Ø	796,60						
1316	0	79289						
1315	0	790,23						
1370	6	788,35						V
1326×								Trip out Purp
		id						
Comment	s: Pun	p Devel	opment.					

Project Name: EXCELS (OR	Project No.: 38691
Well No .: NSH-OZZ	Date: 1-23-15
Location: WSH-BF	Measuring Point: TOP OF SOUNDING TUBE, 1.5 at
Total Depth of Well (ft bls): ル3つ	Screen Interval (ft bls): Society 1010 - 1130
Pump Type/Setting (ft bls):	Activity: SWAB DEVELOPMENT
How Q Measured: -	H&A Personnel: K. Form

Time	Discharge		Specific	Sand	рН	Sp. Cond.	Temp.		Comments
	(gpm)	Water Level	Capacity	Content		(µmhos/cm)	°F		
		(ft)	(gpm/ft)	(ppm)					
1645	ADD	CHASED	1/2 6	ALLON	Aar	A Cro	An pF	OA	OWH
		CHASED	WITT	~ 50	00 G1	TUONS	WATE	FR	
715	SWF	HBB/NG	Serie	5000s	W7	57VAZ		- 4	
1915	215	1PPES 5	MAB	BING	Sori	TONED	INTE	nuar	
	7								
						)			×
			341						·
Comments	s:								
201111101110	٠.								

## **FIELD DATA LOG**

Project Name: EXCELSION	Project No.: 38681
Well No.: NSH-02Z	Date: 1-24-15: 1-25-15
Location: NSH - BF	Measuring Point: 70P OF SOUNDING TUBE & 1.5'
	Screen Interval (ft bls): /0/0 -//30
Pump Type/Setting (ft bls): Grun DESS & 2900'	Activity: PUMP DOVERSPINENT, 2 SWAB
How Q Measured: TIME to FILL BULKET	H&A Personnel: J. Cook, C. GANNON

Time	Discharge		Specific	Sand	рН	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level	DRAWDOW	Content		(µmhos/cm)	°C	
		(ft)	(FT/gpm	(ppm)			°C	
~0615	STA	LTES 5	MAB					
20815					, /Nº	STAZUA	6 Pun	P
1300	STAN	TOS Pu	MPING	TUR	BID	BLACK	Qscit	RISE WITH
		DOOR	OF	Payn	15R,	TURNE		WWW , TURBID.
1353	3~1	854.1	TOV	310 6	NOON	51 B	NOWN	
1500	21	-	TURI	310,	Gnor	' nu/	~ 3U~	LL GRAY FINGS
1550	2/	-	TUR	B10	TO C	LOUDY	<0.5	mell Finos
1630	21	869.2	NR	BID Ti	Cio	104 Br	own	20.2 ml/L FINE
1630			248	40.2	6.8	337	14.7	,
1740	~	865.4	244	40.7	-	_	_	TUNBID TO CLOUDY
1745	0	SHUT	Down	موبع د	TH	E DAY	J	
1200	21	867,8	2460	<0,2	7.3	467	19,5	
						- 4		
								2

Project Name: Existor	Project No.: 3868/
Well No.: NSH-02Z	Date: 1-75-15
Location: NSH-BF	Measuring Point: Topof Sounding tube ~1.5' als
Total Depth of Well (ft bls): 1130	Screen Interval (ft bls): 1/30-1010
Pump Type/Setting (ft bls): SUBMERS BUE TO 900	Activity: Pump Development
How Q Measured: Time to Fill Bucket	H&A Personnel: J Cook, cooker

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific DrawDow	Sand Content (ppm)	pН	Sp. Cond. (μmhos/cm)	Temp. °F	Comments
0600	26	628		4 44	Turbid		own,	Begin Pumping
			_		9,3	318		
0900	21	868,9	241	2012	Turbid 8,2	391	lighter	continue pumplins
1000	~1			10,2	Twbid, 8,15	Brown 402		Continue Pumping
1100	الد			40,2	Tuibid 8.Z	Brown 417	lighter	continue Pumping
1200	~1	867,8	240	20,2	Tubid 7,43	BROWN 425	19	Continue Pumpies
1300	~1	867.7	240	40,7	Taisi Bilg	d Brown 481	22.1	Continue Pumpins
1400	N	966,85	739	60.7	Turb. 8.29	d B100	27.8	Continue Punjoins
1500	-(	866.90	239	C0.2	tw:	375	~~	Constitue pimpie
1600	~ \	NA		40.2	ligh 7,77	+ + + + m		continue Dimpins
1700 1800	~1	STOPP	50 PU	<0.1 MPING	TUR		cu	DUDY, NO FNOS
Commen	ts: Stat	k ~ 6°	21' DN	1P ,	Flan	, mete	r Rea	ds 0 due to
	low	Flow						
			·	<u> </u>				

#### PUMPING TEST FIELD DATA LOG

Project Name: 64c6LSICR	Project No.: 3868/
Well No .: NSH-022	Test Start Date & Time: /-26-15 @ 0600
Static Water Level (ft bmp): 640,20	Measuring Point: TOP OF 1" PVC , 1.5 als
Total Depth of Well (ft bls): 1130	Screen Interval (ft bis): i010 - 1130
Pump Type/Setting (ft bls): SuBMENSIBLE e 900'	Pump Contractor: NATIONAL
How Q Measured: EM From MERON AND TIME	H&A Personnel: C. GARRAGE

TO RU BUCKET

Date & Time	Totalizer (gals)	Discharge (instant., gpm)	Pumping Water Level (feet,bmp)	Conductivity (µS/cm)	рН	Temp	Comments
0600	0	60	640.20		STATIO	WATE	LAVER
0600+	START	50 Run	PING V	ALVE N	1105 OPE		
0607	21.5	21.54	-	_	100	_	= 30.W/L TIMES
0604	-	18.80	721.60	257	8.91	19.9	TURBID-CLOURY
0605	_	17.28	743.0	387	7.95	19.9	CLOUDY, OMELL
0608		14.36	7-73.75	397	7.57	19,9	CLOUDY, ONLL
0608 A	DS VALUE	5 70	~ Zgpm			100	
@ Cell	-		779.2	-		THE PARTY	
0 615	-	1.16	785.9	402	7.84	21.0	aousy-asm
0616	123.76		30 300		-		
0620		0.33	795.0	3960	7.38	20.9	CLOSOT-CLEAN,
0621:30	127.00-	-> EM B	TON MESE	R NOT -	vankine -	LOW RAT	£ 69,4 NTU
0625		0.33	801	399	7.87	21.4	CLOUDT - CLEAR 5
00ZCe	- /	- Z.590	m ~/ F	NUKOT	, BM +	ou con	
0630	1	-2.0	810.22	408	8.01	21,9	aosoy-CLEAR 55.8
0635		22.0	816.65	401	8.04	21.1	aoury-asan 543
0640		2.0	822.0	404	8,05	21:60	away-CLEAR 53.1
0645	_	22.0	827.9	405	8.09	21.6	48, (NOV
0650	-	12,0	830.833.	34 400	8.07	21,5	49.7 NTU
0700		~1.5	841.54	398	8.10	20.8	48.1 NTV
0715		21.1	850.20	399	8.14	21.1	46.1 NTU
0770	-	21.1	852,92	399	8.14	21.0	42.8 NW
0730	九 —	21.0	856,57	396	8.15	20:7	41.1 NTU
0740	1	~1.0	83 859.60	6 397	8.15	20.7	39.2 MW
0750	-	~1.0	862,07	392	8.19	20.5	38.7 NTV
0802	-	2/.0	864.11	-		(1	

Additional Comments:

100 mg

0810 -115 NSH-026 e - 405', MIPPING ONT

### PUMPING TEST FIELD DATA LOG

Well No.: NSH- OZZ	Static Water Level (ft bmp): 640.20
Pump Contractor Personel: GuY	H&A Personnel: C. GANDNER

Date & Time	Totalizer (gals)	Discharge (instant., gpm)	Pumping Water Level (feet,bmp)	Conductivity (µS/cm)	рН	Temp	Comments
0815	- N	2000	865.46	350	8.21	-	37,3 NTU
0815+	STOPPE	5 Pun	PING,	STAN	OF	RECOVE	FRY
0816	-	0	853.3			700	
0817	-	0	839.60	λ.			
0818	_	0	828.0		1		
0819	-	0	817.8				
0820	_	a	809.4				
0822	_	0	799.85				
0824	_	0	797.00				
0826	_	0	796.40				,308.131
0828	_	0	795.80				
0830	_	0	795.20				
0835	_	0	793.40				
0840	_	0	792.00			1	
0845		0	790.30				
0850		0	788.80			-	
0855		0	787.15				
0900	—	O	785.40				
200/	1	/	1	- 0		h ~	
2906	PULLES	200N D7	on , con	m KI	LING	RMP	
	Z		78				
						+ +	
			2				
						+ +	11.1
							14/1
						+ +	The way

Project Name: WS EXCESSION	Project No.: 39681
Well No.: NSH-023	Date: Z-3-15
Location: NSH-DD	Measuring Point: —
Total Depth of Well (ft bls): 1446	Screen Interval (ft bis): OPEN 646-1446
Pump Type/Setting (ft bls): AIRLINE, VARIOUS	Activity: ARLIFT DO GLODMONT
How Q Measured: VISUAL ESTIMATION	H&A Personnel:

Time	Discharge	Pumping	Specific	Sand	рН	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level	Capacity	Content		(µmhos/cm)	×	
		(ft)	(gpm/ft)	(ppm)			00	
1050	STANT	GS AM	LIEM	K t	Snow	~ 90	OFOOV	
1052	~10	_	TUNB	ID B	ROWA	,~0	-5 me/L	SAND & GRAVER
1055	-10	- t	MBID	BROOM	UN, .	o, Sall	SAND	~1.0 ml/ GANGE, ATTR
1100	~10	TURB	36 As	Nuo	, ~ 0	-3 mel	FINE	-MEDIUM SAND
1110	210	-	1	0.2	TURB	D Bron	UN, 5	42 NO
1130	~10	_	_	20.1	TURS,	DTO CU	Yavo	205 NAU
1145	20	-	-	2011	7.70	384	22.8	CLOSDY, 109 NTU
11450	0	SHUT D	own f	TRUE	, RE	ECOUEN	1 sue	
1205	STA	TIES A	RUFT	F	on	~800		
1210	20	_ ' '	_	1.6>	7.92	381	22.5	CLOUDY ,78. LNOU
12260	210	_	,	401	7.99	382	72,7	CLOUDY, 73,7 NTV
1226	tosth	T OPF	ARCH	T, IN	STANLI	NG A	PLINE	70 900'
1245	STA	भारत्या गर	- Aneu	in-	From	-900	0 188	7
1250	25	. –	FINE SAN	0.1	7.93	368	22.6	CLOS DY, 90.8 NOW
1300	125	- En	& SAND	0.1	7.94	363	23,3	CLOUDY, 113 NAU
1315	~25	-	1	20.1	7.94	351	22,9	WOUDY-CUBAR, 48.ZNTU
1320	0 (	CONTINI	o Ann	LINE	10	~1000 t	301.	
1345	Anu	FING F	non	-100	OFE	FOT		
1350	-30	-	-	<0.1	7.86	340	21.2	CLOUDY · CLEAR, Z7, LATU
1400	-30	- 51	ue sand	0.9	7.94	321	0.55	TURBID, 858 MU
1445	230	- EIA	is sono	0.8	7.95	353	21.6	TUBID-CLOUDY, 194 WIN
1510	130	- FNE	SAND	0.2	8.0	360	22.0	TURBID-CLOUDT , 169 NTU
1510+	0	SHUT DO	UN F	on -	Sunci	F DEF	ouen,	
1526	STA	NOTES AT	ruits	FROM		100 PS	57 1	MASIO TO CLOUDY, 178NO
1545	~30	FE-OX TINE	FSAND	0.4	7.96	370	22.0	TUNBIO - CWUDY, 178NTU
1600	~30	PE-ON FINI	FERNO	8.5	8.03	375	23.0	TURBID-CLOUDY, 168 MTU
1615	~30	FROX FIN	5-SAND	0.5	802	378	228	TURBID-CLOUDY, 18/MD
1630	130	FE-OX BY	= SOND	0.3	8.03	380	33	TUNBID - CLOUDY; UI NTU
1650	230	Fe-ox F	NE SAND	003	8.03	379	22.5	TUNBO-CLOUDY BINTU
Comment	ts:		-	200		0	_	
//	MOCEN	- NURSHTO	01	400 4	0 90	)J 700	,	1971 00 973
1700	12	Panale	NA E.	SAU	000	321	7711	71420 0 0 0 0 101
1700	) 50	b Kook of	HUS, HAR	0.7	0.05	フィナ	66,9	TURBID-CLOUSY, LOLATE
								Salar Sa

Project Name: Exelsia	Project No.: 38681
Well No.: NSH- 023	Date: 1-21-65
Location: NSH-DD	Measuring Point: TOP OF 1" PUC 11,04 als
Total Depth of Well (ft bls): 1446	Screen Interval (ft bis): 0850 646 - 1446
Pump Type/Setting (ft bls): SUBMENS/BLE, ~ 900	Activity: PUMP DOISUSTUPINED
How Q Measured: APT From METER	H&A Personnel: C. PNCE

Discharge	Pumping	Specific	Sand	рН	Sp. Cond.	Temp.	Comments
(gpm)	Water Level	Capacity	Content		(µmhos/cm)	°F	
	(ft) DMP	(gpm/ft)	(ppm)				
	627.35						STATIC WATER LOUGE
_							
18:06	646,9						
					4		
	653.1						
9,89	653,9						
29	655.1						
218	675.75		1				Clearing out flow meter
9	673,4						
18.3	728	0.17					
17,5	736,45				Pump	off	Still has Foam, AST
Reisley	658				•		, , ,
frecovery	6418.5				Pump	00.	
9,39	677.60			Y			io mins
8.56	680.35						20 Mins
7,34	680,50						
7,17	674.0						
6,85	678,12						
6.68	677.09					413	
18.34	702,87			and bear			
17.06	717,74						Clear, Some Fram.
16,56	724.62		*				
16.34	729.08						
16,00	732,22						
15.84	734.24						6
17,00	734,56						
16,78	742 11						
16.62	743,93				3.5		
	18.06 11.46 8.5 9.89 29 218 9 17.5 8.30 17.5 8.66 7.34 7.12 6.88 6.68 18.34 17.06 16.36 16.36 16.36 16.39 16.36 16.39 17.00	18.06 646.9 11.46 852.05 8.5 653.1 9.89 653.9 29 655.1 29 675.25 9 673.4 18.3 729 17.5 736.45 2000.0 648.5 678.12 6.68 677.09 18.34 702.87 17.06 717.74 16.56 724.67 16.34 729.08 16.00 732.22 15.84 734.24 17.00 734.56	18:06 646:9  11.46 852.05  8.5 653.1  9.89 653.9  29 653.9  19 673.4  18.3 728 0.17  17.5 736:45  2000:1 658  Lewry 618.5  9.56 680.35  7.34 680.50  7.17 679.0  6.85 678:12  6.68 677.09  18:34 702.87  17.06 717.74  16:56 729.08  16:00 732,22  15:84 734.24  17.00 739.56	(33.45) (18.06) 646.9  11.46 852.05  8.5 653.1  9.89 653.9  29 655.15  9 673.4  18.3 729 0.17  17.5 736.45  20.00.7 648.5  9.56 680.35  7.34 680.50  7.17 679.0  6.85 678.12  6.68 677.09  18.34 702.87  17.06 717.74  16.56 724.67  16.34 729.08  16.00 732.22  15.84 734.24  17.00 739.56	(33.45)  (18.06) 646.9  11.46 852.05  8.5 653.1  9.89 653.9  29 655.15  9 673.4  18.3 729 0.17  17.5 736.45  Becovery 648.5  9.56 680.35  7.34 680.50  7.17 679.0  6.85 678.12  6.68 677.09  18.34 702.87  17.06 717.74  16.56 724.67  16.34 729.08  16.00 732.22  15.84 734.24  17.00 734.56	18,06 646,9 11.46 852,05 8.5 653,1 9,89 653,9 29 655,1 in 19 675,75 9 673,4 18,3 729 0,17 17,5 736,45 Permp econcy 648,5 A,39 677,60 8,56 680,35 7,34 680,50 7,17 674,0 6,85 678,12 6,68 677,09 18,34 702,87 17,06 717,74 16,56 724,67 16,34 729,08 16,00 732,22 15,84 734,24 17,00 739,56	18:06 646:9  11.46 852.05  8.5 653.1  4.89 653.9  29 655.15  418 3 729 0.17  17.5 736:45  Permy Off  Ecology 688  Fewery 648.5  7.34 680.50  7.17 679.0  6.85 678:12  6.68 677.09  18:34 702.87  17.06 717.74  16:56 724.67  16:34 729.08  16:00 732.22  15:84 734.24  17.00 734.56

Project Name: Exicts	Project No.: 39691
Well No .: NGH-023	Date: 1-21-65
Location: NS4-DD	Measuring Point: TOP OF 14 PVC 11.04 als
Total Depth of Well (ft bls): 1446	Screen Interval (ft bls): SPEN 646-1446
Pump Type/Setting (ft bls): 50Bm61518C6, 1900	Activity: PUMP DEVEROPMENT
How Q Measured: GPT From METER	H&A Personnel: C. Pace

Time	Discharge (gpm)	Pumping Water Level	Specific Capacity	Sand Content	рН	Sp. Cond.	Temp. °F	STATIC & 627.33 bm
	(9)	(ft) bmP	(gpm/ft)	(ppm)				7/13/10 0 00/10
1125	16,50	745.65	0.14					\$5118,3 F
4	16.11	746,88						
1145	16,78	747.64						12/ 43
200	Recovery			aml				Start Pumping
1210	1840	726.31						. 3
270	17.33	737.11						
220+	0							
230	~10			lmL		Stut P	1100 144	Valve open 100%
240	17.84	729,30			W.		, ,	
1250	15,12	736,50		>				
250+	0							Begin Recovery
1300	20,46			1,2541	4)	Start	Pumping	Valve Open 1000
331	16:78	743.20						
1331+	0							Begin Recovery
1340				lm		Start	Pumping	Begin Recovery
1410	0		7					Best Recovery
								, , , , , , , , , , , , , , , , , , , ,
								*
5-1-1-4								
151								
			-					2
omment	ts:							

#### AIRLIET DEVELOPMENT FIELD DATA LOG

Project Name: OXCESIDE	Project No.: 368G
Well No .: NSX-024	Date: 2-2 2015
Location: NSH-DC	Measuring Point: —
Total Depth of Well (ft bls): 1440	Screen Interval (ft bls): OPEN 625 - 1440
Pump Type/Setting (ft bls): ARUTT VANIOUS	Activity: ARLIFT DEVOTOP MONT
How Q Measured: VISUAZ ESTIMATE	H&A Personnel: C. GANDON ST

Time	Discharge	Pumping	Specific	Sand	рН	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level	Capacity	Content		(µmhos/cm)	%	
		(ft)	(gpm/ft)	-(ppm)			2	
1305	~10	SANTOD	ARU	A FI	com -	-8w',	UNBID	Brown-CLOUDY
		-	-0	.Znl	/L SA	UD (MOD.	BNE),	0.2 Myl Graver ABrildo 61
		-	1	1901	A P	WBIDIT	,	
1310	~10		-	1907		60 SAN	5 TUNB	O Brown - CLOUDY, 323non
1370	~10		-	0.5 F	NE SA	T ON	UNBID &	THUMN TO CLOUDY 253 MIT
1325	~10			0.1 E	NJ 5	AND		CLOUDY, 106 NTU
330	~10		*	<0.1	7.6	389	21.7	CLOUDY-CLEAR, 45,7 NO
1330+	0							
1340	STANT	GD MI	RUFT		) gpm			
1345	~10	-	^	4.0 61	iasa	ABNILO 2	atz	CLOUDT-CLIGAR, 78.ZNTU
1350	~10	_	-	0.2 F	NE SP	AND	-	CLOSON-CLEAN, 139MN
1355	20	-	_	0.250	6 5AM	4D	_	CLOSOY-CLEAN, 130 NOV
1400	20	" Ac"	-	40.1 F	NE 51	END	_	CLOUDY, 92,7 NTU
1400 t	STOPPE	50 ARLI	PT. LO	MENING	6 AV	LINE -	0 -84	O PEST.
1415	Anl	FING						
1420	210				VE SA			CLOUDY, 61.8 NOV
1425	~10		-	2011	8.1	401	22.3	and, 59.9 NTU
1425+			ARUFT	Low	BrING	Dim	10	900 POST
1440	Arel	IFTING						
1445	120		-	2011	8.04	394	21.5	CLOUDY, 99, SNOW
1450	20	,—	-	10.1	_	_	1	CLOUDY, 63,6 NTU
1452	0	STOPPED	An	EF,	ONE	いいし	pros	TO 940 FOOT.
1505	STANT	5 Anu	B					
510	220	-	_	40.1	-	-	- 1	20007, 86,5 NAO
155	~20		_	<0,1	8.10	401	22.5	CLOUDY, Cel. SNAV
1520	~20	1	-	20,1	_	_	-	CLOUDT, 92,5 NTU
1520t	0	500 APPEC	Anu	LFF	10 F22	C Dové	MIER	AND.
		70	Lowis	ER 1	Anzu.	SE TO	1 11C	DOO FREET.
Commen	ts:							
	181							

Project Name: EXCELSION	Project No.: 36861
Well No.: NSH-024	Date: Z-Z-Z015
Location: NSA - DC	Measuring Point:
Total Depth of Well (ft bls): 1440	Screen Interval (ft bis): OPEN 625-1440
Pump Type/Setting (ft bls): Anling - 1000'	Activity: AMULT DENEROPMENT
How Q Measured: VISUAL ESTIMATION	H&A Personnel: Cr GANONEN

Time	Discharge (gpm)	Pumping Water Level	Specific Capacity	Sand Content	рН	Sp. Cond. (µmhos/cm)	Temp. ∘F	Comments
		(ft)	(gpm/ft)	(ppm)				
1540	STAN	TOD MIT	LIFT	From	NIC	WO FOR	57	
545	~20	_	_	2011	8.03	399	22,4	CLOUDY-CLEAN, 48. INTV
1550	120	-	-	20,1	-	-	-	CUGAN, 29.3 NOU
1555	~20			40.1	81.13	400	22.8	CLEAN-CLEAN, 65.60 KB
1600	-20	.—		0.1 5	NE SA	- on	_	CLONDY-CLOAN 97, CONT
11000+	SHUT	Down	Ancie	7,	NRGE	Porco!	veri.	
11010	START	50 Mai	IPT	,				
1615	220	_	_	20,1	_	_	-	CLOUDT-CLEAN 57,2WN
	RATE	Droppe	5 TH	EN U	1CMB4		D - 40	Dagon
1620	240	-	-	40.1	8.01	396	222	CLOUSY-CLOSM, 53.2N
425	~30	_	-	<0.1	~	-	-	clovery-cern, Cel. Inon
1630	~30	1	-	201	8.09	397	22.6	CLOUDY-CLOSM, 48,5m
1635	230	_	-	201	-	_	-	0004-COM, 43,5 N
1640	~30	-		40.1	8.09	392	21.9	CLOUDY-CLOSM, 38,7NA
1640+	SHUT	- Down	Anu	By F	DUINC	o AIR	UNT.	
				, ·				Y I I I I I I I I I I I I I I I I I I I
				72				
14								
Commen	ts:							

Project Name: EXCELSION	Project No.: 38681
	Date: 2-9-15
Location: NSUK-DP	Measuring Point: TOP OF 14 PVC, 1.46 als
	Screen Interval (ft bls): 1480 - 1551
	Activity: PUMP DEVEROPMENT
How Q Measured: GPJ From MGGA	H&A Personnel: C. GANDNEN

Time	Discharge	Pumping	Specific	Sand	рН	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level	Capacity	Content		(µmhos/cm)	°C	
		(ft)	(gpm/ft)	(ppm)			°C	
1625	0	64.20	-	_	1	STATU		
630	STAT	obti	MPING	PS	DUE	5 FW	m al	500 ~50M
1636	4,70	718,1	)	0	-	_	_	CLOUDY, LIGHT GRAY W/ AT
1440	4.92	927,2	0,04	0		-	-	" " 153 NW 55
1645	4.75	744,0	0.04	_	_	-	-	COUDY LIGHT GRATINI
1650	4.66	7645		0	8,79	352	21.6	85.1 WYU
1655	3.92	781.1			8.53	354	241	WHITE 40/ALR -> CLOUBY>
655	+ AD	SUSTE	> RA	7	0~5	s.l apm		48,4MU K
700	4.20	800,0		)	" -	7.	-	
700	LOA +	)	ם ת	5,59	pm			
1705	3.98	820,9	0:02	00	8,51	364	22.2	GRAY W/ AIR - CLOUDY 65,
1705	+ AD	JUSTED	tone	5.1 91	m			- John Common Co
1710	123	829.5	GPT	ex	PIDE	70U	FULL	, -3 gpm u/ Bucker
1715	1.4	808.0	VA	- t	MOOY	OPF	W.	1
720	-2.0	793.4	0.01	0	8.53	357	21.6	CLOUDY W/ AND + CLOAR 47
1730	22.5	793.9	0.01	0	8.53	363		CLOUDY W/ AIR - CLOAN 39.5
1740	12.5	798.1	0.01	0	8.54	367		CLOUDY W/ ANR-> CLEAR 48,3
1750	~2.5	802,4	0.01	0	8,53	344	22.8	CLOUDY W/ANZ > CLOTA 5003
1200	12.9	806.7	0.01	0	8.53	324	21.7	CLOUDY 75.4NAU
1810	22.6	808.9	0.01	0	8.56	322	21.9	CLOUDY 65,4 NTU
1820	~2.3	811,8	Oral	0	8.47	372	226	CLOUDY CECOINTU
1930	.2.3	812,6	0.01	0	8.54	315	23.1	PURSID GRAY TO CLEVET
183		0.0	W. W.	*				190 NT.
		7	1.1.	19	W. Const.			77 - 19 ( )
	72				AND AND A		13635	1
					7.3			
	7 0						W. P	
			53.00		500			
Comment	ts:							
					500	C III		100
		151						
								17

Project Name: Excelsion	Project No.: 38681
Well No.: NS14-025	Date: 2/10/15
Location: NSH-DP	Measuring Point: Top of 1" PUC , 1.46' ALS
Total Depth of Well (ft bls): 1557	Screen Interval (ft bls): 1480-1551
1 2 2	Activity: Pump Development
	H&A Personnel: 5, CoulnG5

Time	Discharge	Pumping	Specific	Sand	pН	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level	Capacity (gpm/ft)	Content		(µmhos/cm)	°F	
		(ft)	(gpm/ft)	(ppm)			2	
610		638.10		6	7.92	1.650	19.41	
615	2,50	\$22.7	COG PONSY		7.92	1,650	19.41	water Tising very turb
620	225	805.4	1		8.35	968	19.51	
625	1.8	799.3			8,43	836	19,55	Lt Gray - Very turb
630	2.1	791.4			8.39	886	20,42	Tubb over
635	8.3	787.1			8.31	979	20.50	
640	2.4	785.9			8.26	1147	20.53	L+ Gray - very turk
645	2.5	785.5			8.38	1296	20.31	,
650	2.3	784.3			8.39	1442	20.56	
655	2.3	783.1			8.15	3431	20,79	Grayish brown Air
700	2:1	781,5	110		8.22	2438	21.48	Air
705	2.1	781,1	4	λ	8.25	2376	21.51	Grayish brown Air
710	2.1	780.4			8.26	2324	22.13	
715	2.1	778.4			8,26	2278	22,24	Brown Air
720	2.3	779.3			8,25	3338	22.40	Brown AIR
725	2.6	781.3		1	8.24	207	22.86	Brown Air
730	2.3	781.8	1		8.24	2173	23,18	Brown Ar
735	2.3	782.3			8.23	2136	23,22	Brown AIT
740	2.3	782.5		- 116	834	2101	23.29	
745	2.2	782,1			8.22	2072	23.89	
750	3.5	782.9			-	-	-	
755					7			
806								
805								
810								
		87.4						
						1979		and a
Commen	ts:		1	1				
			8 1	-				
			-	3	3			

## DEVELOPMENT Bailing

## **FIELD DATA LOG**

Project Name: 5xc5sion	Project No.: 38681
Well No.: NEXT-OZO	Date: Z-7-15
Location: NSH - BE	Measuring Point: TOP OF ALZLING AT Frank
Total Depth of Well (ft bls): 900	Screen Interval (ft bls): OPEN 625 to 9007
Pump Type/Setting (ft bls): AIRLIET ~ 780	Activity: AIRLIFT DOUGLAPMONT
	H&A Personnel: Wielsen

	Discharge	Pumping	Specific	Sand	рН	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level	Gapacity	Content		(µmhos/cm)		
	Bailingan	(ft)	(gpm/ft)	Content Morra		-us/cm	oc oc	
		599.5	Turbiclely					
1500	1		48.3	_	7.34	438	21.66	V. Clear
1510	2		67.2	0.28 Fann	7.21	436	20.80	mclear; slight from
1517	3		101.0	0.3 11	7.66	437	20.64	stictudy; 11 11
1520	4		257.0	1.0 11	7.54	483	20.35	un in Reddish
1525	5		47.5	0.2 11	7.35	433	24.55	mostly clav; slight foam.
1528	6			0.5 11	7.44	448 .	20.37	slight cloudy , sl foom; Pel color
1532	7		119.0	0.3 11	7.47	433	20.31	n 2 11 11
538	8		203	0.3 11	7.45	447	20.22	te is a started
543	9			0.7 11	7.53	464	20.31	n n w it it
545	10		194	0.5 11	7.53	472	20.49	n u
548	11		153	0.2 "	7.45	439	20.09	- u
553	12		181	0.3 "	7.60	487	20.15	H to te ty
557	13		128	0.2 "	7.45	442	20.55	200
1601	14		154		7.45	447	20.49	
		1	+	RA.				
		EV		DY-	PLI	NG		

	Project No.: 38681
Well No.: USH-027	Date: 2-7-15
Location: NSH-BG	Measuring Point: TOP OF 1 PUCE 1.85 als
Total Depth of Well (ft bls): 1010	Screen Interval (ft bls): 865-1010
Pump Type/Setting (ft bls): 855 Zw-18 c 849	Activity: PUMP DEVELOPMENT
How Q Measured: EM From METERS	H&A Personnel: C. GARDNEN

Time	Discharge		Specific	Sand	pH	Sp. Cond.	Temp.	Comments
TRA TO	(gpm)	Water Level	Capacity	Content		(μmhos/cm)	°F	
		Pmai (tt)	(gpm/ft)	(ppm)				
100	0	551.42						
128	0	553.60						
129	+ 57	ander 4	UMPIA	16				A 1917
131	93	SEENG	WAT	on.	ADI	FOTNE	6A	DE VALVE
132	26			,				
133	9						, 2-	
136	9.27	580.52	0.32	0.0		×		FORMY 05529.18
142	9,110	580.85	0.31	-		_	-	DRULING FLUIS
150	-	533.4						BOUE of From the
150	- OPEN	-33 6	178	VAZI	10	o Pun	60	
151	85	DAFILL	OCT Y	2 50	JUN		ruces	FLUID
503	70	FLUSH	100	SONO	ING	409E		
512	68	Bove	14	50	UNE	,	BNO	MZ)
539	75	726.80	0.42	0.2	TU,	1310	BRAY.	FUXCULATED - 250 ME/
550	72	727.40	0.41	0.5	TUN	,	or to	10000 LATED - 150 mel/
555	68	730.60	-	0.5	401	30 G		Frocculation -125mel
200	68	728,00	) _	0.8	Tun	BID G	WY !	FUCCULATES - Whill
010	67	728.18		-	-		_ '	
415	68	729.45	-	-	-	-	-	
620	88	729.00	-	-	-	-	1	
625	66	729.75	-	0.3	TUN	LBID 6	RAY, t	FLOCEULATED, 280ML1
630	68	728.80	_	-	-		1	71
040	67	729.20		0.3	TUN	310 G	LAY, F	LOCCULATED ~ 100mel
650	67	729.85	-	1	+	1	1	
700	67	729.08	-	-	-	-	-	
719	66	732.15	-	+	-	-	1	
720	66	733.52	_	0.1	-	-	-	CLOUDY TO TURBED ?
730	67	729.70	-	į		_	-	TURBID GASY, FLOCUSTATI
740	67	729.85			-		-	01720 01Mark
mments	38	10+ Da	PEUEN	lo 12 m	201	RAADS	a C	1774
e 1/1	00						ala = "	
		Mechan		UM	3	DODE RE	MOS:	
		RELATI	NE P	Bris	101	DIFFE	non co	: 5.2% 4.9%

	Project No.: 38681
Well No.: NSH-077	Date: 2-7-15
	Measuring Point: FOF OF 1" PUC 21.85 als
Total Depth of Well (ft bls): LOLO	Screen Interval (ft bls): 865 - 1010
Pump Type/Setting (ft bls): 855700 - 18 + 849	Activity: PLMP DEVSLOPMENT
	H&A Personnel: C. GAMONER, C. PRICE

Time	Discharge	Pumping	Specific	Sand	рН	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level	Capacity	Content (ppm)		(µmhos/cm)	×	STATIC 553.6 From
		(ft)	(gpm/ft)	( <del>ppm)</del>		. / - **	00	
1750	66.7	730.00	0.38	0.2	7.16	438	21.8	TOTAL ROSIDUAL CL=0.5
	- 1		Tuni	MOITE		80 NT		NO OIL ON GREATSE
1800	601	733.25	~	0.1	7,44	440	21.9	FLOCKULATED COONELL
1815	66.5	731.38	-	~	-	-	-	- 30m1/L
1840	66.7	729.84	_	0.1	-	-	-	-46 m1/L
1900	66.9	729,54	-	0.1	_	_	-	-60 mi/L
1915	66.7	729.04	-	011	_	_	- '	35 ml/L Flockulate
							F	/
1920	Pin	np o	F9	40	roch	avge		
						0		
1937	~	591.24	)	~	~	,—	_	
1940	Pun	10 on						
1943	72.56	1690.99	_	0.5	_	_	_	40 mill Flockulate
2012	68.65	716.44	_	5.0	~	_	_	80 m/L Flock-late
2030	106.43	729.86	)	0.3	v	-	_	45 m/L "
2045	106 645	730-64	1	0.1	-	_	_	65 mi/L
-	62,05	Relativ			FFere	1000 0	om =	7,19%
2106	67.30	727.34	7	20,1	-	_ 3		52.5 turbidity - no Flock
	67.72	724.74	-	0.9	_	_	_	30 ml/L Flock, late
2144	67.5	725.64		0,4	_	~		40 mill Frockelete
2260	67.5	726.50	,	0.1				90 ml/L Flockiletz
2400	011)	10.50		0.1		7		10 mile 3 locking
2201	D.	ump os	FI					
2233	3	584.68			-			
2235	12		^					
2237	773	652.39	-	0.4	-	_		no Thalesh to
	770		0 55			_	_	no Flockulate
4412	14.7	031.10	0100	017				11
2348	72.9	687.19	0.55		-	-	-	11

Project Name: Excelsion	Project No.: 3 8681
Well No.: NSH - 027	Date: 2-7-15
Location: NSH-BG	Measuring Point: top of 1" DVC 1.85 Als
Total Depth of Well (ft bls): 1010	Screen Interval (ft bls): 865 - 1010
Pump Type/Setting (ft bls): 855 700 -18 849	Activity: Pump Development
How Q Measured: EM FIDW Meter	H&A Personnel: C Price

Time	Discharge	Pumping	Specific	Sand	рН	Sp. Cond.	Temp.	Static 553.6 6mp
	(gpm)	Water Level	Capacity	Content (ppm)		(μmhos/cm)	-	Static 353.6 bmp
		(ft)	(gpm/ft)	(ppm)	His Us L		00	
300	70.0	706.82	-	0.2	-	-	_	no Flockulate
3320	67.5	727.35	~	20.1	_	~	)	Turbidity 303 NTV
3335	68.0	723.09	-	0.1	-	-	-	4m1/L For No Flack vicitio
2345	67.4	725.43	-	20.1	-	_	_	957 NTU,
2000	66.5	73308		0	-	_	-	cloudy, no Flackulate
2015	66.3	734.0a	-	8	6.74	378	20,6	33.7 NTU
0030	6637	334.32		0	7.30	385	21.4	24.4 NTU
	62.25							
045	66.2	734.55	0,33	0	7.37	386	21.6	cloudy wair -> clear 2.
0100	66.0	734.46	-	0	7.33	385	22.0	17.4 NTU
		-						
9105	P	imp of 3						
		,						
0120		ms on	0	~10	ppm	_	ing	10d 4pm
0125	9.50	617.40	-	0.1	7,20	366	20.14	33.5 NTV
2130	9.60	605.72	Openio .	20:1	7.4	384	21.0	433 NTU
135	9.60	603.68	-	0	7.4	389	21.3	369 NTU
NUO	9.71	600.93	-	0	7.4	387	21.6	171 Ntu
2145	9.67	599.41	-	0	7.4	391	33.6	150 NTU.
150	969	597.72	-	0	2.5	393	22.0	139 NIU
155	9.69	596.66	-	0	7.6	388	21.0	236 NTU 0.97 4 mg
200	9.71	595-55	-	0	7.5	382	21.3	38.8 NTU
205	9.70	594.76	-	0	7.5	379	えのフ	10,9 NTU
1207		G-PM	increa	sed	+	20.		
209	19.31	604.14	_	0	7.5	391	22.2	9,61 NTV 0,19 CI
7215	18.41	607.74	2	0	7.5	-	-	Clear
	18.03	607.01	-	0	7.5	404	23.8	Clear 3.80 NTU
2225	18.04	606.65	-	0	7.4	410	24.4	cloudy wair > clear
0225	18.03	607.74	-	0	7.5 7.5 7.4	404	23.8	Clear 3.80N7

Project Name: Excelsion	Project No.: 3 8661
Well No.: NらH -0 27	Date: 2-8-15
Location: NSH-RG	Measuring Point: top of 1" PVC 1.85° A15
Total Depth of Well (ft bls): 1016	Screen Interval (ft bls): \$65~1010
Pump Type/Setting (ft bls): 855700-18 849	Activity: Purpo Development
How Q Measured: EM Flow Meter	H&A Personnel: Price

Time	Discharge	Pumping	Specific	Sand	рН	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level	Capacity	Content		(µmhos/cm)	°F	Static @
		(ft)	(gpm/ft)	(ppm)				553.6 pmp
1230	18.03	606-64	0.34	0	7.5	410	24.2	cloudy w/air > clear
1235	18.03	606.76	-	0	7.5	404	23.5	cloudy wlair -> clear
2340	18.01	606.22	-	0	7.5	410	23.6	Llear
245	18.12	606.98	-	0	7.5	409	23.7	cloudy whair sclear
	17.64	606.63	-	0	7.5	410	23.6	cloudy wair > clean
2251	-	GPM	increa	used	to	36:00	2	
7253	35.06	624.82	9:48	0	7.6	415	24.0	cloudy w/air >
300	32.81	633,28	-	0	7.7	430	23.0	Cloudy ->cloudy
3	2-110	0337000					, ,	( , , , , , , , ,
0302	ν	alup o	pene	d to	hv	ina	GPM	to 36.76
3305	35.15	637.89	7	0	7,5	414	23, 1	cloudy wair -> slightly &
	34.43	639.13	_	0	7.6	416	22,5	cloudy
	34.40	639.44	_	0	7.5	409	23.0	slightly cloudy 446.
2320	34.44	640.18	-	0	7.5	407	23.0	slightly cloudy 283 M
	34.39	640-43	~	0	7.6	405	22.6	slightly cloudy
	34,20	640.64	~	0	7.6	409	23.0	Slightly cloudy
0335	34.27	640.34	_	0	7.0		5(3.0	slightly cloudy
0,73	- (.2/	040.07						31.4 1114 210001
0337	D	haa	チチ					
000/	3	ump o	7					
10.7								
4								
			- 25					
		Mel	rometrer,	GPI				
Comment	5 63	:56 3	459/2	1 68	6-PM			
	_ 00					FFeren	· -	4.4%
		F	E ICITIVE	Terce	VIT PI	Jeiev	Ce -	4,7,4
								1



Project Name: TXCEISLOR	Project No.: 36861
Well No.: NSH-028	Date: Z-4-17
Location: NSH-BH	Measuring Point: —
Total Depth of Well (ft bls):	Screen Interval (ft bis): OPEN 544 ro 800
Pump Type/Setting (ft bls): ARLLUS @ ~760	Activity: ARLLES DEVELOPMENT
How Q Measured: VISUAL ESTIMATION	H&A Personnel: C. GANDNON

Time	Discharge	Pumping	Specific	Sand	рН	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level	Capacity	Content		(µmhos/cm)	×	
		(ft)	(gpm/ft)	200			oc.	
115	ARCL	PINC	From	~ -	7607	TOOT		
120	~5	)		5 mell		Zamn	BS, -0,	SNUL SAND, FOAMY 183
130	25	-	21.5,		SNE TO			DANUT, TURBIO BROWN
140	~3	-	1	200 m	R/C FIN	F SANS		Y TURBIN BROWN
55	~2	1	1	0.9 ml	L SNI	5 SAND,	FOAMY.	TURBID BROWN
205	12	1	1	0-60	n	u.	n	u u
208	0	SAUT DE	A your	MURT	For	RECO	5001	SUR46
218	Anzl	PTNG	0855	2003	GNAVE	2-51360	CUTT	WOS OR CLOX & MANGH
220	25	~2.01	ILL FINE	f-cas	SAND	~3,0 ml	LL GAA	VEL, TURSID Brown, For
300	2	-	١	0.2	7.76	393	21,8	TURBID-CLOUDY, 513 NTU
325	12	SOME FO	200	0.2	8.06	389	22.0	TURBIO-CLOUDY, 380NT
32le	0	SHUT	Down	800	L RE	EUUST	そか	NOT
340	STAR	180 AM	LIPT	Carl	=			
345	25	some to	Sem	Q75AN	8,02	374	22.60	TUNBID TO CLOUDY, 490 NT
400	12	SOME FORM	-	0.2	8.08	392		TURBIO TO CLOUDY, 387 MM
415	~2	SOME FOR	w _	0.2	8.12	388	221	TUNGO TO CLOUDY, 359 MT
415+	0	SHUT	Down	AWZ	1150	PULLIA	16 ANG	LIND.
	+						8	
comment	s:							

Project Name: EXCASIOR	Project No.: 38681
Well No.: NSH-028	Date: 2/6/15
Location: NSH-5H	Measuring Point: 700 00 1" PUC & 0.25' als
Total Depth of Well (ft bls):	Screen Interval (ft bls): DOFN 544 to 800 FF
Pump Type/Setting (ft bls): 40500 30 € 750	Activity: DIMP DAVS-OPMENT
How Q Measured: FM FOW METBES	H&A Personnel: C. GANONON

	Discharge	Pumping	Specific	Sand	рН	Sp. Cond.	Temp.	Comments	1
	(gpm)	Water Level (ft) Long	Capacity	Content		(µmhos/cm)	AF.		
		(ft) With	(gpm/ft)	(ppm)			00		
1300	0	565.85				No.			
310	0	505,92						STATIC WATER LEVER	1
1311	STAT	TOD F	AMS	NG					1
314	32		18mmpto	0.0	7.19	351	19.9	TUNBID=6,73 NO	1
1315	30.82	6225		_	-	-	_	100	
319	25.48	664.8		-	_	-	_		1
322	22,94	688.1		-	_	-	_	McM = 27,80 gm	1
1325	STOCK	711.0		0.0	7.36	362	21.9	14	5.
1329	STUCK	731.2						25.30 gpm	
13:30	ADS		116	10 -	10 g1	m		- 1	1
332	8.92	773.4.	7		9	T. C.			1
1335	3.59	746.6	CANO	ANDO	or w	won.	w	Mc= 4.07 ypm	8.
33/	60		BALL	WAZUE				1336 30	1
339	0	732,00	,			FCONT	121000		
341	0	725,30		9,4		2000	CC C6.	S DISCAN OC,	1
1355		710.30							1
1400		701.35			14				1
414	0	695,00	A 18 18			- 2			1
4177	0	68730	BY LE					~ ~ Sam	
1430	0	494.4						Thorn a sale	1
43524	578	mile	Amp.	56-	YEAR	2773	PANE	to algon	
14/3/0	1-1	705,80	700	low	The state of the s	EM	FULL	Motorisas	
1447	1.09	704.00	100	0000	9-1	1	7 .00	Zgals IN 1:50 = 1.090	w
4410	1.04	702,60	4					Zula IN 1:55= 1:04	41.4
1451	1.04	700.85		<b>FI</b>				1:55	3
14510	1.09	1009 75	10					1:50	
1500	1.09	1997.85	100					1:50	
- 27 26 1	1.09	696.25		0.0	7107	356	21.0	1:50	
500	1,00	1000000	30	0.0	4.00	000	2110	1130	

Project Name: BX65002	Project No.; 38681
Well No.: NSH-OZ8	Date: 2/0/15
Location: NSH-BH	Measuring Point: TOP OF 1" PUC & 0,725 als
Total Depth of Well (ft bls):	Screen Interval (ft bls): OPEN 544 - 800
Pump Type/Setting (ft bls): 405100-30 4 750	Activity: Kimp Daysopmont
How Q Measured: TIME TO Phi BUKET	H&A Personnel: C. GANDNET

Time	Discharge		Specific	Sand	рН	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level (ft)	Capacity	Content		(μmhos/cm)	oc oc	
		(ft) brit	(gpm/ft)	(ppm)				
1513	1.09	694,55	TOTAL	- C60	MUAR C	Hornes	0.07學	Zgalo 10 1:50, 4,091
			NO OI	L AN	D (GR	SASE	اعد	0
	60	197						
521	1.09	692.60						Zgals in 1:50
	161	1088.65						,
545		687.31						2gal in 1:48.41
550		686.36					Male	
555		685.47						agal in 146 19 1346
600		684.52			-			
1605		683.70						agal in 14703
4610		682.98						
1615		682.26						agal in 1:46.90
1620		681.68						
625	1	681.10						agal in 1344.37 agal in 105 1:05
1630	2	680.22	21631	ADSU	800 N	RATE	-	agal in 105" 1:05
1639	1	681.10						वेजुल
1640		681.42	1 1	*				2gal in 1100
1645		681.91						the state
1650		682.51						20pl 59,51
1655		683.05						
1700		683.52						2gal 1:01.83
1705		684.32						3
1710		684.87						2gal 1:01,16
1715	100	685.48					173	
1720		686.05						2001 1:01 38
1725		686.65						•
1730	¥	687.21						agal 1:01, 22
17:35	V	688.68	1		200			
17:35 Comments	s:							

Project Name: FXCSLSIOR	Project No.; 38681
Well No.: 154-028	Date: 2/6/15
Location: NSH-13H	Measuring Point: 701 OF L" PUC
Total Depth of Well (ft bls): 900	Screen Interval (ft bls): Of 544-800
Pump Type/Setting (ft bls): 405 (00 - 30 = 750	Activity: PUMP DEGOPMENT
How Q Measured: TIME TO FILL BIXXET	

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pН	Sp. Cond. (µmhos/cm)	Temp. ℉	Comments  SAME ON 26 565.85
740	~2	688.38	(3)	(1-1)				2991 1:02,34
745	1	689,04						
750		689.57						29 1100 72
755		690:11						
1800	4	689.57 690:11 690:63		243				agal 1.01 85
1800	+ 5H	UT DO	er f	EMP	とし			
2-	7-15	5						
1039	0	568,40 568,15 568,10	4-0.	051				*
220	0	568.15	4-0.0	5'				
153z	0	568,10						
						7		-
2								
								1
		1 4 1						
	1111				154 12			
								9
Comment	is:							

Project Name: Excelsion	Project No.: 36861	
Well No.: NSH-029	Date: 2/8/15 -2/9/15	
Location: NSH-DQ	Measuring Point: —	
Total Depth of Well (ft bls): 709;4	Screen Interval (ft bls): 604-709-4 655	(COR1 709.5
Pump Type/Setting (ft bls): Ba, ling	Activity: Airlift Dove I coment	
How Q Measured: Visual Estimate	H&A Personnel: \( \square\) \( \square\) \( \left( \square\) \( \square\)	
Turbidily		

Time Discharge Pumping-Specific Sand pΗ Sp. Cond. Temp. Comments -Water-Level (mhoo/em) 2°C Capacity Content (gpm) Bailer# (<del>ppm</del>) water onk-(g<del>pm/ft</del>) 60 ml Orlal clear 1625 8.18 2 459 21.14 med cloudy i green grey; black flek 1630 1000 ml 313 0-195. 462 3 1000 ml 0-1 45. 21.18 8.27 ŧι 2/8/15 1437 653 4 20.62 1648 375 ml 0.1 8.31 474 663 700 ml 1657 5 492 6.1 8.33 475 21.01 slaply chooly green grey ; black fleck 1704 6 495 465 20.83 001 8.34 1.1 LUOU ML 1 [ 900 7 (COO ml 49.9 7.94 426 19.70 0.1 cleur 8 295 443 904 8.11 1000 ml 0.05 20.34 slightly cloudy i like brown 9 448 0-05 913 530 8,18 P1.98 700 ml check , crange braun , 10 New Bull 929 1000 mL 8.12 461 0.05 19.75 V cludy , die grage beun Werenge

932 11 0- 45 8.19 459 700 ml 19.67 1.1 808 0.05 937 900 mi 8.24 464 20.53 12 1.1 950 468 20.55 11 t = l13 788 0.05 8.20 1000 ml 804 8.30 17 955 470 20.68 14 gw ml Iŧ 692 468 20,43 11 8.30 1000 15 1000 ml W 20.42 752 1000 16 700 ml 8.31 466 11 1.1 17 8.28 1012 461 20-25 700 ml 6009 11 11 18 1020 900 -1 415 8.10 4142 20, 81 1.6

Comments:

#### Air Lift/ Baiting **DEVELOPMENT FIELD DATA LOG**

Project Name: Excelsion	Project No.: 3861
Well No.: NSH-030	Date: 2/8/15 -2/9/15
Location: NSH-DR	Measuring Point: —
Total Depth of Well (ft bls): 705.57	Screen Interval (ft bis): 600 - 705.5
Pump Type/Setting (ft bls): Andine @ 6801	Activity: Air lift Development.
	H&A Personnel: T. Nielsen

Turbidiki Specific Sp. Cond. Temp. Time Discharge Pumping Sand рН Comments (mahos/cm) Water Level Content (ppm) Capacity (gpm) (ft) (gpm/ft) 1,0 Ul black fleck ; hishly 230 0.25 Med brown 50.25 0.2 1.1 12-10 ٠, 5 0.25 1250 11 Stort bailing w/ 1" disposable Sto 1515 baller 350 ml 1420 677 1551 20.79 averronge NLA 7.61 550 mc 420 NIA 7.89 665 1557 20.37 20.63 9W ml HD N/A 7.82 669 1603 NIA 7.83 628 20.55 1609 550 ml 140 Ü ii. wface END Recharging 7 ir pressur Feit es Bailing 2/9/12 Comments:

Project No.: 35681
Date: 3615
Measuring Point: TOP DI Z" UKING 61.92'als
Screen Interval (ft bis): 721 - 805
Activity: BAIL DE ECOPMENT
H&A Personnel: C. GAMMEN, T. NEUSON

Time	Discharge	Pumping	Specific	Sand	pН	Sp. Cond.	Temp.	Comments
	10-112	Water Level	Capacity	Content	+	(µmhos/cm)	٩F	
	GALS	(ft)	(gpm/ft)	(ppm)		No record		• 1
1115	0	564.47	STATIC	N.C.	STA	COOT		UNG, Mygod/BAIL
130		-9		0	8.91	456	18.3	79NOU CLOAN
145	2			0	8.45	479	18:73	143 NTU little disco
210	3			0	8.02	483	18.06	236 NTU clove
240	4.		7	0	8015	1138	18.90	NTU block
1300	S		4	0	8.52	Ce04	1850	
1315	6		- 13	0	7.30	450	18.66	
1330	7.		- 63	0	8.42	510	18,49	9
1345	8			0	8.26	516	18140	
1400	9	- 1			45.44	4109	18.54	
145	10			0	8-51	469	18.51	
1430		4	W. Salar	0	8,21	519	18.38	
1445	12			0	8.20	493	19,62	The second second
1500	13			0	e.31	498	18.41	
1510	14	A and		0	7,44	485	18.17	
1520	115	100	-	0	7.93	494	18.16	
1535	16	1		0	\$ 35	448	18,20	
1550	17	- V5L . d	41	0	8.34	457	18.27	279nTU
1210	18	1 Marien		0	8.37	498	18.28	
luzo	19	100	100	6	8.54	449	18.25	- 14
1625	10	V400 0.00		0	840	482	18,43	
1645	21		1	0	8.35	499	17.95	
1655	22	The second		05	8.25	473	18,37	The second second
TTIO	23			0	8.29	487	18:12	
					To 315 1		THE PARTY	
ALL AR	1	Alberta V	1915		10 h		Contract of	200 A 30 11 1 1 10 10 10 10 10 10 10 10 10 10 1
and the same						<b>经验证</b>	- 8	Life State S
B. W.	Production	A STATE OF		The second	A CONTRACTOR OF THE PARTY OF TH			THE RESERVE OF STREET
Comme	nts:							
- 120			3		-11	13 - 54		

#### AIRLIFT

### DEVELOPMENT FIELD DATA LOG

Project Name: EXCELSIOR	Project No.: 38681
Well Site: NSH-032	Date: 2-23-15 to 2-24-15
Location: NSH ·	Measuring Point: TOP of 2" CSG (1.96 A als)
Total Depth of Well (ft, bls): \277	Screen Interval (ft bis): 1180 -1260
Pump Type/Setting (ft, bls): Aポルレット	Activity: ARUFT DEVELOP
	H&A Personnel: (GARDNER

Tubidity **Pumping** Specific Sand Condutivity Discharge Temp. Comments рΗ Time Water Level Capacity Content (gpm) (taS/cm) (°F) (ft) (gpm/ft) (ppml) 571.95 before airlif 1200 Θ AIRLINE INSTAULED TO ~ 700 FT START AIRLIFT 1530 8.18 514 1650 ~1 148 NTU dondy MOVE AFRLING TO ~ 780 FI 1335 AIRLIFT AT ~ 19pm Turbid 1700 ~ 1 1930 STOP ANRLIFT 2 24/15 START AIRLIFT ~ 18PM 0840 570 62 NTU 8.10 0920 cloudy to clear STOP AIRLIFT 0930 Additional Comments:

#### **APPENDIX D**

Geophysical Logs (provided in separate PDF)



#### **APPENDIX E**

**Corehole Cleanout Records** 



# 1 P

#### DEVELOPMENT FIELD DATA LOG

Project Name: Exclosor Mucha	Project No.:
Well No.: ∠\$ - 3,7	Date: 12/5/14 / 12/8/14
Location:	Measuring Point: 65
Total Depth of Well (ft bls): (1200) 800?	Screen Interval (ft bls): Open hale 524-800+?
Pump Type/Setting (ft bls): all line 1.5"	Activity: Pugney
How Q Measured: Estimated visually	H&A Personnel: O. Miles

mg/1 70 DS Time Discharge Pumping Specific Comments Sand pН Sp. Cond. Temp. (gpm) Water Level Capacity Content (µmhos/cm) (ft) (gpm/ft) (ppm) An 44 35 1230 50 110 0.6 8.4 0250 Black tur bil 1240 AN acala 40 recover 1255 50 250 8.9 ~0.5 270 600 1305 ~50 350 n-0. 曾,5 730 20,9 5.34 3/12 1313 5 2 H 3/7 500 134-462 -600 VA SO JL 50 turbed -640 1400 250 1400 -60 1-115 5 + 9 rall 756 \* (1940)+ PHAPMU 1500 7/4 water ~15.20 525 Sore -800 0.7 270 6 20-10ts 0. ~60-X rock Chr. ve Sal 101 945 10/0 290 74 7-7, 600 -20 1.0 79 270 560 1200 2.0 530 ~10-15 260 0,3 530 250 236 Slothytes 540 Strakth 23.5 505 240 Comments: 12/5/14 4 hours 2000-2500 total Sand. Gome

Project Name: (FUNNSON) EXCELS 10-	Project No.: 38681 - 1/3
Well No.: NSD-001	Date: /2/12/14
Location:	Measuring Point:
Total Depth of Well (ft bls): 1509	Screen Interval (ft bls): 460 - 1509 (GRA) MILLE PUC
Pump Type/Setting (ft bls):	Activity:
How Q Measured: Wished Estments	H&A Personnel: O. Miles

BAY Off OUT

D. MARS  Temp. Comments  Black, turbid  clear, strath churchy  B. Black Yurbid  24.2 Coldy  33.7 Shapty choudy  Black turbid  23.7 Chyphty choudy  A recovery from
Black, turbed  clear, stratth cloudy  Broth Yurbed  242 Coldy  33.7 Stathly cloudy  Black turbed  23.7 Stathly cloudy  According from
Black, turbed  clear strath cloudy  Brown Yurbed  24.2 Chidy  33.7 Stathy cloudy  Black turbed  23.7 Stathy cloudy  t recovery from
Clear, strath checky  British Yurbred  24.2 Chicay  3.7 Slaphtly Cloudy  Black tourball  23.7 Slaphtly cloudy  A recovery from
Clear, strath checky  Boston Yurbrd  24.2 Chicky  Slaghtly Cloudy  Black turbor  23.7 Slaghtly Cloudy  A clovery from
23.7 Sloghtly Clouds Black turbal  23.7 Sloghtly Cloudy  **Transport Cloudy
23.7 Slayhty Clouds Black turbul  23.7 Slayhty Clouds  **The Cloudy  **T
23.7 Slephty clouds Black toward  23.7 Slephth cloudy  + recovery from
23.7 Swylith closely
t scovery from
& Movey from

Project Name: Excessor/ 6 Manison	Project No.: 386 21 - 117
Well No.:	Date: /2/10/14
Location:	Measuring Point:
Total Depth of Well (ft bls): 1906	Screen Interval (ft bls): 7 - 1906
Pump Type/Setting (ft bls):	Activity:
How Q Measured:	H&A Personnel: O Mles

TOS ME Specific Comments Pumping рΗ Sp. Cond. Temp. Time Discharge Sand ℉ Capacity (gpm) Water Level Content (µmhos/cm) (gpm/ft) (ft) (ppm) 1520 600 turked 705 680 705 330 20.8 635 15 640 310 7.6 20.5  $\subset$ 705 10 Becoming Lesi Knobill 1700 680 0.3 730 310 310 7.2 640 233 @40 7.9 300 30 1040 1040 290 600 23.4 243 1340 7,9 30 1145 790 600 500 24.4 1146 280 40 2.0 1250 300 008 570 40 OISI 0.2 570 Tripped Comments:

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Project Name: Excelsion	Project No.: 38681
Well No.: NSD-019	Date: 1-13-15
Location:	Measuring Point:
Total Depth of Well (ft bls): 1454	Screen Interval (ft bls): Casing to 620, Open hole
Pump Type/Setting (ft bls): Air/iJL From	Activity: Airlift develop
How Q Measured: Visual Estimate	H&A Personnel: L Price

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pН	Sp. Cond. (μmhos/cm)	Temp. °F	Comments
-				-				
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## COREHOLE DEVELOPMENT FIELD DATA LOG

Project Name: Exelips/ Gunnison	Project No.:
Well Site: NSD-026	Date: \2/9/14
Location: New hosping 11 stde	Cased Depth (ft, bls): 431
Total Depth of Corehole (ft, bls): 168	Measuring Point:
How Q Measured: Estmated	Staff: O.Miles

TUS (mg/L) total Bootch Discharge **Airline** Sand Time Condutivity Pate Temp. Depth Content рΗ Comments (mS/cm) (gpm) (°F) (ft) (m//t) 50 504 Black 25 529 /190 470 22.7 425 546 20 10 9/4 525 73.6 400 440 10 52F 190 390 23.6 10 1445 525 10 140 400 236 4.54 10 525 40 09 C 72.9 10/445 505 525 190 400 22-4 Cloudy Brown 515 10 8.2 22.7 410 1535 10 410 77.6 1050 10 82 430 20.2 1615 10 27/210 470 71 640 8.0 430 10 01/20 21.1 Strawt/ 1700 10 Pump toter ~1500 4 Colume Additional Comments:

Project Name: 5XC52516(2	Project No.: 36681
Well No.: NSD-027	Date: 1-6-15
Location:	Measuring Point:
Total Depth of Well (ft bls): 1004	Screen Interval (ft bis): CASING TO 400, OFTH HOLD
	Activity: ARLIFT DISTOR COMPOSTON
How Q Measured: USUAL ESTIMATION	H&A Personnel: C. GARDNER K. FORD

Time	Discharge	Pumping	Specific	Sand	pН	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level	Capacity	Content		(µmhos/cm)	00	
		(ft)	(gpm/ft)	Content (ppin)			0C	
0910	~15		-	-5.000	TUNBI	D. T2 1		APRIFITACO
970	1/5	<u> </u>	_	10	TUNI		SOME (	
0975	0	SUNG	5 Pã	Cove	RZT			1
0930	~15			8	701	80	10ME	COPPER ONE PSANO
240	2/5	-		9	1	61D		in i n
1000	2/5	٠		2	7.4	370	FRESI	AND AND TIMES TOMBIE
030	215	**************************************		0.3	7,4	400	22.11	CLOUDY COURS
1030	0	5UNG	5 Pi	だのど	e, .	~15m	N T	
345	215		_	Z	7,5	400		TURBID TO CLOUDY
100	~ 15	٠	,	0,4	7.5	390	21.4	CLOUBY
110	~ 15	*		0.4	7.7	380	21.6	CLOUSY
1120	~15	- contract	-	0.2	7.8	380	21.9	CLOUBY
1130	0	SURGE	REDVERY	1 - ~	15 M			
1145	~ 15	-14		0.7	7.8	390	21.6	CLOUDY
1200	~ 15	-	_	0,3	7.9	400	21.9	CLOUDY
1210	~ 15	-	ower.	0.2	7.9	390	21.9	CLOUSY
1220	~15	-	Jr.	0,1	7.9	400	21.6	CLOUSY
1230	~15	*	·-	40.1	7.9	390	210	WOUNT
1240	~15	-		40.1	8.0	400	21.4	CLOUDY
								Ý
	-	<u> </u>	<u> </u>	.1		<u> </u>		
Commen	ts:							
***************************************								
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Project Name: Exceusion	Project No.: 3868 1
Well No.: NSD-028	Date: 1-9-15
Location:	Measuring Point:
Total Depth of Well (ft bls): 755	Screen Interval (ft bls): operhale 400 - 755'
Pump Type/Setting (ft bls): ARLIFT FROM 740' b/s	Activity: AIRLIFT DEVELOP
How Q Measured: いいしょし	H&A Personnel: KENDRA FORD

Time	Discharge	o Pumping	Specific	Sand	рН	Sp. Cond.	Temp.	Comments
	(gpm)		Capacity	Content		(µmhos/cm)	數	
		Degit (ft)	(gpm/ft)	(ppm)			٠,٢	
1040	STA	RY AIRLIEN	76					black
1045	~9	740		1.0	Commission of the second of the second	and the property of the second	the rest wind natural distillation days for the second	dak grey, horbid
1048	STOP, 1	ECOULR 15	Mid					3 1
1100	STAR	T AIRLIATIA	6					Black Ok grey
1103	~9			0.8	TURB	D, FLO	ce	dark grey turbid Froce (see
1115	~9			0.3	TURB	id From	cc	dark grey (lighter), tursid to
1125	~ 9			0.2	TURA	Bito		grey, tusted to cloudy
1136	~ 9			0.7	TURR	10 FU	cc	BLACK, habid Floce (sed)
1145	-9			0.1	TURY	870		grey, tusid to doudy
1155	0	STOP REC	DUER					
1220		T AIRIGH	NO		. **	A, sug		
1225	~9			0.2	TURE	in		dork grey tubid
1245	~9			0.1	TURE	Ti Ci		grey turbed to cloudy
1300	~9			0.1	TURE	o i o		grey tursid to clouds
131年	~9			0.1	TURS	s ib		grey twoid to dondy
1330	~9			0.1	TIRE	$\mathcal{D}$		arey twind to clardy
1355	0	STOP RECO	VER					
1410	START	AIRLIPH A	10					* * * * * * * * * * * * * * * * * * * *
1414	~9			02				grey, cloudy
1432	~9			0-1				grey dondy
1445	~ 9			0.1				grey closedy
-1500	~9			20,1	8.1	560	F .	lighter grey, cloudy
1530	0	STOP REC	over					3 0 1
1549	START	Air LIFTIN	હ					
1552	-9			0.1	8.0	570	20.0	Righter arey cloudy
1606	~9			<0.1	8.1	560	72.1	grey, cloudy
1620	~9			<0.1	5.8	630	22.3	light grey cloudy
1635	~9			<0.1	8.2	570	24.8	light gray cloudy
_								0 0 11 1
Comment	ts:			ı				en e
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Project Name: EXCELSIOR	Project No.: 3868 !
Well No.: NSD-OZ8	Date: 1-8-15
Location:	Measuring Point:
Total Depth of Well (ft bls): 755	Screen Interval (ft bls): ope Lole 400-755'
Pump Type/Setting (ft bls): ARUFT FROM 740 8 5	Activity: AIRLIFT DEVELOP
	H&A Personnel: VENDRA FORD

anelfino рН Sp. Cond. Temp. Comments Specific Sand Time Discharge e... Water Level (gpm) Capacity Content (µmhos/cm) (gpm/ft) (ft) (ppm) 560 ~ 9 40.1 8.2 22.0 1650 740 40,1 22.3 8.2 ~ 9 550 1705 1707 Comments:

11/21/14 AW 0815 6G AW 0850 NGD-030

Page \_\_\_\_\_\_\_ of \_\_\_\_\_

#### DEVELOPMENT FIELD DATA LOG

DIAM 31+ = 3.7" = 0.56 9 Allons / F+

Project Name: GUNNHON	Project No.:	
Well No.: NSD 030	Date: 11/21/14	
Location: North & FREEMAN	Measuring Point:	
Total Depth of Well (ft bls): 762	Screen Interval (ft bls):	
Pump Type/Setting (ft bls):	Activity:	
How Q Measured: Bright	H&A Personnel: G. Foush EE Chris	HARDNER

TDS Comments Sp. Cond. Temp. Specific Sand рΗ Pumping Discharge Time (umhos/cm) ۰F Content Water Level Capacity (gpm) (ft) (gpm/ft) (ppm) 500 19.8 Beson Sursing @ 142 7.9 TR. 15/2 19.9 590 916 TR 1535 16.6 15 min. Intervals F90 7.9 1507 0.1 19.0 1560 400 19.59 Tr 520 19.6 my. SURGER WILLERS 18.9 7 7.6 500 10 5 1 1 h Misch Frank Ch 490 -CR Copy / From relyen 550 MALLA Tin NOGON w 20.4 680 FIRST TOURL WI FEW SET LY FROM 7,4 SUSpect DAMPELING BOYGLE 21.4 120 DOW 600 1053 w 670

205 7.9 1130 NI 40 598 20.9 7.7 20 1150 WI Threeno ON GOO, FOME FROM MICHS, 20.7 10 7.8 360 1200 Bapw 20.6 E. W 7.0 1220 540 20.6 79 din'n 1240 20.0 7.9 12,00 10 520 19,50 1320 540 TRB CA(NBYON-CO) @ 1340 260 1340 20.8 E, 40 7. 3 260 1400 7.9 450 21.2 250 10 MIN 5 F0 21.6 8 79 250 14AD 20,8 7.9 550 250 10 10 1500 F 万场 7.0 70.1 250 1520

101.4 240 719 570 1540 490 20.2 240 6.0 10 7, 1600 500 19.2 230 1030 250 1700

Comments:

Stuples to Ranionwoliges, TOC, INDIGNIC EMIL, SOL, NOX, ALK+BICHER,

CHANGE @ 1700

N 3000 GALLONS DWGED > 10 CV

GNL IMMIN 358, TD 767

GETO INTERVEL 409.

HALEY &

1- 1 - 11 - 17 90mm

1628

11/22/14

Cashg: 410 WL: 546 T1):~1700

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	780-002-00-		

## COREHOLE DEVELOPMENT FIELD DATA LOG

Project Name: Excolcior	Project No.: 38681-117
Well Site: NSD-อนี่ (NSD-V)	Date: 12/14/14

Time	Discharge Rate (gpm)	Airline Depth (ft)	Sand Content (mt/l)	рН	Condutivity (mS/cm)	Temp.	Comments
084 <b>Q</b>	40-50	1220					Burbiel Foams Brown
0850							Grey furbid, less
9920			0.3	7.8	810	70.4	Grey ver cloud.
0950	30-40		0.2	7-7	790	23,5	
1070	***		0.2	8-0	770	23,4	Gry cloudy
1050			0.1	8:7	770	3.4	
1120			0.1	8.1	760	23.4	
(130			0.	8.0	740	23,4	li .
1220	1.75		02	8,0	750	23.2	Cf.
320			0.	8-1	700	22.7	Stryktly close
1330	048		mas	VC1 ha		0:40	· · · · · · · · · · · · · · · · · · ·
1700	30-40	1220	0.2	9.1	680	22.6	cloudy
1420	30-40	1220		8-3	-620	23.7	Strackly clo
Tripp.	400						
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	Sec.						
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	Comments:	around ) resel for	Lea	rie	ct su	Hace.	**************************************
	10.0	198301 +60	well Sni	Wed	order CI	rface.	



## COREHOLE DEVELOPMENT FIELD DATA LOG

Project Name:	Project No.: 3868(-113
Well Site: Nが-04プ	Date: 12/15/14 // 12/16/14
Location: N5D-≨	Cased Depth (ft, bls):
Total Depth of Corehole (ft, bls): 🗠 1700	Measuring Point:
How Q Measured: Estimated.	Staff: O. Miles

Time	Discharge Rate (gpm)	Airline Depth (ft)	Sand Content (m//i)	рН	Condutivity (mS/cm)	Temp. (°F)	Comments
425	10-15	1220	Drill	uch.			Very to Mark
<b>4</b> 45	~5	1220	Drill	myd			
505	~10-15	1220	Drill	mud.			
520	~10	1220	Drill	mud			
540	~10	1220	Drill	Mad.			<u> </u>
555	<u>&gt;</u> 5	1220	Drill	Med			yeary turbed
Purged		05, 15	off u	A1 1:	730. 50	me Mc	seased Ponductron
2/16,	(14						
0845	Parge	W for	1	mmsj	94,11 to	Mil;	DAM and
2 an =	PO (you		extura	vater			
905	Shet	dow	+ ANDPR	g out.			
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dditiona	Comments:						
TTT-THOTIONOLUMENTAL			2440 O				
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## DE MINIMIS DISCHARGE to EPHEMERAL WATERS FIELD DATA LOG

Project Name: Excels to	Project No.: 38681-113
Well Site: NSM-005a	Activity:
How Q Measured:	Staff: Kyke Mohr

Total Duration Discharge Total Date & of Residual Oil & Turbidity Rate Discharge Activity/Comments Discharge Time Grease (NTU) Chlorine (gpm) (gallons) (minutes) (mg/l) 12-19-14 968-127 10-15 10-15 1150-1400 1420-1455 10-15 35 1530-1700 10-15 30 923-935 Additional Comments:

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Page	1	of	

Project Name: EXCEUSIOR	Project No.: 38681
Well No.: NSM -006	Date: 2-16-15
Location:	Measuring Point:
Total Depth of Well (ft bls):	Screen Interval (ft bls):
Pump Type/Setting (ft bls): 960 F.	Activity: DEVELOPMENT
How Q Measured: VISUAL ESTIMATE	H&A Personnel: KFOR)

Time	Discharge	Pumping	Specific	Sand	pН	Sp. Cond.	Temp.	Comments
	(gpm)	Water Level	Capacity	Content		(µmhos/cm)	۳F	
		(ft)	(gpm/ft)	(ppm)				
0831	STAR	I AIRLIF	アンマ				and the state of t	
S 5 20	~5			0,5				boun, douby
0925	~5			0.5				bown, cloudy bown, cloudy
0927	STOP	MRLIFTIN	G. REG					
0943		MRLIFTIN						
0945	~5			0.6				brown doudy
1000	STOPPE	3 Anu	F					
1030	SM	res An	WIFT	0.5	3			TURBIS
1100	~5	res An		0.1				TURBIS TO CLOUDY
1140 1200	25		Ancio	0				CLOUDY TO CLOUDY CLOUDY TO CLOTAN
1200	~5			0				CLOUDT TO CLOTA
6200	- <i>5</i> 9	oppas	AMILIE	7 , 8	JULIN	6 ATT	RUNE	
				,				
		***************************************				`		·
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		****						
					<u> </u>			
Comment	s:							
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Project Name: Excelsion	Project No.: 3868
Well No.: NS M - OOF	Date: 2/10/15 - 2/11/15
Location:	Measuring Point:
Total Depth of Well (ft bls): 1250	Screen Interval (ft bls): open hale below 540 ft
Pump Type/Setting (ft bls): Air, LFL form 900 FE	Activity: Air 1774
	H&A Personnel: Niclsen

Arrhore Dorth Time Discharge Specific Sand рΗ Sp. Cond. Temp. Comments ٩F Water Level Content (gpm) Capacity (µmhos/cm) (gpm/ft) (<del>ppm</del>) (ft) 1150 Skert 20 900 Aurds ares brun, turbel 1250 0-2 20 1305 900 0.2 20 900 0-2 4 1320 340 20 0.1 drawn 1 Model 900 9W il 20 11 1355 0-1 20 1 ( 1 ( 1410 900 0.1 1 ( 1.1 1) 11 9w 14/25 0.1 Á 17 900 1440 20 0-1 1. 8.16 443 20 72 dun 654 0-1 Shut 15W ZO 900 15h4 brun 1600 0-1 med 200 1615 20 0-1 brun little de 11 1630 20 Que light 1.0 20 900 0-1 11 2.8 Shu Leur 0.3 20 200 light wo 1710 20 0-1 1/30 11 11 17200 20 900 0-1 1 1 11 11 1730 1.0 . ( 11 20 íŧ έĸ 01 20 έĸ Comments:

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## COREHOLE DEVELOPMENT FIELD DATA LOG

Project Name: Gunnison / Exactson	Project No.: 38687-113
Well Site: Nรm - บธจุ	Date: 12-17-94

Time	Discharge Rate (gpm)	Airline Depth (ft)	Sand Content (m//i)	рН	Condutivity (mS/cm)	Temp. (°F)	Comments
1040	~35-40	1220	5				Tunde o
1137	~35-40	1220	5				Twhid, fory, bruging sud
1220	~35-40	1220	, 3	7.0	390	Cementon	Charles I I I I
1235	~3540	1220	2,5	7.1	420		Dead of the second
1320	35-40	mo	.7	7,2	390	23.8 24.5	Church 1111
1410	35-40	1220	3.5	7.5	400	24.7	MIKE have
537	35-40	ilro	~\$.5	7.5	370	22.8	Jubid Dord grun Chener, by bet brown Perk gray Cloudy - light brown Milky brown Cloudy light brown
							-
							-
Additional	Comments:						

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# DE MINIMIS DISCHARGE to EPHEMERAL WATERS FIELD DATA LOG BJ Pump Rig

Project Name: Excelsion Project No.: 38681

Well Site: NSM-011

Activity:

How Q Measured: Visual Estimate Staff: C Price, C Gardner

Date & Time	Duration of Discharge (minutes)	Discharge Rate (gpm)	Total Discharge (gallons)	Total Residual Chlorine (mg/l)	Oil & Grease	Turbidity (NTU)	Activity/Comments
1600	900	30	3000	0.04	1000	463	Start 15:20 - 17:00
<i>0900</i>	6.0	40	2400	0,06	none	239	08:35 - 09:3
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### COREHOLE DEVELOPMENT FIELD DATA LOG

Project Name: Excelsion	Project No.: 35681-1/3
Well Site: USM-043	Date: 12-20-14

Discharge Airline Sand Condutivity Temp. Time Rate рΗ Depth Content Comments (mS/cm) (°F) (gpm) (ft) (m#!) 1450 10-15 1200 1635 10-15 0.5 8.4 21.7 1200 1110 1630 10-15 0:2 8.6 1200 980 21.6 Additional Comments: